

SmartPlant Instrumentation

Import and Merger Utilities User's Guide



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SECTION 1

SmartPlant Import and Merger Utilities

This document contains a printable version of the SmartPlant Import and Merger Utilities online help.

Import Utility

The Import Utility enables you to import data from most common database formats into a selected table or module in the SmartPlant Instrumentation database. The Import Utility also provides you access to database platforms other than your own (Oracle, SQL Server, or Sybase Adaptive Server Anywhere).

To import data, you need to have some knowledge of the SmartPlant Instrumentation database structure and concepts such as naming conventions. You should also know how to connect to the source and target databases (for example, correct ODBC profile, or native connection to the database).

The Import Utility is essential because inserting data into SmartPlant Instrumentation is not a trivial matter. Since the SmartPlant Instrumentation table structure is relational, there is a constant maintenance of integrity constraints. You have to keep the relation between the tables and create unique values in the primary key. Therefore, you have to insert data into SmartPlant Instrumentation only through the SmartPlant Instrumentation interface or by using the Import Utility.

If you are importing a value for which the number of characters exceeds the maximum allowed, the Import Utility truncates the extra characters in the target field in the SmartPlant Instrumentation database. If, as a result of truncating the value, the string is identical to an existing value in the database, the Import Utility rejects the import if the value is required to be unique and the import mode in the import link properties is set not to overwrite the existing value.

IMPORTANT If you intend to import a large number of records (more than 400 records) in one import session, you must create a new section in the Intools.ini file called [Rules] and add the following parameter: **disable = y**.

NOTE When importing a satellite project back to the host project, changes made to reference data (redlining, drawing item positions, certain supporting tables and so-forth) on Enhanced Report Utility drawings are not imported back to the host project.

Database Platform Support

The Import Utility provides you with inherent support of the following database platforms and database file formats:

- Oracle (only if you have selected Oracle as your current database platform during Setup)
- SQL Server (only if you have selected SQL Server as your current database platform during Setup)
- Sybase Adaptive Server Anywhere (only if you have selected Sybase Adaptive Server Anywhere as your current database platform during Setup)
- Microsoft Access
- DBF (SmartPlant Instrumentation comes shipped with .dbf files. These files appear in the path <SmartPlant Instrumentation home folder>\Import. You can use these files as examples when learning how to import source data from .dbf files.)
- ASCII delimited files
- Excel worksheets
- Text files

NOTES

- To install drivers and profiles of ODBC platforms other than those listed above, you need to install the appropriate software (for example, Microsoft Excel 7 or later, Microsoft Access).
- SmartPlant Instrumentation supports Microsoft dBase Driver for .dbf files, and Microsoft Text Driver for .txt and .csv files. You can select the driver you require using the ODBC Data Source Administrator in your Windows Administrative Tools.

You can import data from a database platform (for example, Oracle, SQL Server or Sybase Adaptive Server Anywhere) other than your current SmartPlant Instrumentation database platform. To do this, you have to comply with the appropriate system requirements of the external database platform. For example, if your current SmartPlant Instrumentation database platform is Sybase Adaptive Server Anywhere and you want to import data from an Oracle database, you must have Oracle client installed and running on your computer.

You can also import from database platforms other than those specified above. To do this, you need to provide drivers and modify the appropriate configuration files.

See Also

Create an Import Link for an Oracle Source (on page 18)

Create an Import Link for an ODBC Source (on page 17)

Create an Import Link for a File Source (on page 19)

Define a Data Import Source in Excel Spreadsheets (on page 20)

Prerequisite for Using Microsoft Access as an Import Source (on page 20)

Configure ODBC Data Source for Text Files

For text files, the Import Utility uses Microsoft Text drivers (.txt and .csv files). Therefore it is important to properly build the correct profiles. The following steps are necessary to work with FirstVue, Masoneilan, and Flowserve interfaces as well as with Import Utility default parameters.

IMPORTANT In 64-bit environments, certain ODBC profiles and drivers cannot be seen by the SmartPlant software. Additionally, they cannot be added from the **Windows Control Panel**. To add or view these profiles and drivers you need to use the 32-bit version of the Data Sources which is found under %Systemdrive%\Windows\SysWoW64\odbcad32.exe.

1. In your Windows operating system open **Administrative Tools > Data Sources**.
2. On the **ODBC Data Source Administrator** dialog box, click **Add**.

TIP Click **Add** on either the **User DSN** or **System DSN** tab, whichever is appropriate.

3. On the **Create New Data Source** dialog box, from the **Name** list select the Microsoft Text Driver (*.txt; *.csv).
4. Click **Finish**.
5. On the **ODBC Text Setup** dialog box, type in the **Data Source Name** and **Description** for your database.
6. Clear the **Use Current Directory** check box.

IMPORTANT If the **Use Current Directory** check box is selected, you will not be able to define the format.

7. Click **OK**.

NOTE This concludes the required steps needed for .csv and .txt files. However, if you want to use comma delimited data, do not click **OK** and continue the procedure as follows:

1. Clear the **Use Current Directory** check box.
2. Click the **Select Directory** button.
3. Select an appropriate folder that contains text files.
4. Click **Options**.
5. In the **Files** pane click **Define Text Format**.
6. In the **Define Text Format** dialog box choose the **Format** of your database.

TIPS

- You can use the Custom Delimited format and enter a **Delimiter**, if you are not using commas or tabs.
- The default **Rows to Scan** is 25. This number can be changed to suit your database structure.

7. Click **OK**.
8. Select the **Use Current Directory** check box.

IMPORTANT If the **Use Current Directory** check box is not selected, the driver will not be able to find the correct files.

9. Click **OK**.

For further details, see the user's guide for your database platform.

Configure ODBC Data Source for DBF Files

The Import Utility supports only Microsoft dBase drivers for .dbf files. Therefore it is important to properly build the correct profiles. The following steps are necessary to work with the Import Utility default parameters.

IMPORTANT In 64-bit environments, certain ODBC profiles and drivers cannot be seen by the SmartPlant software. Additionally, they cannot be added from the **Windows Control Panel**. To add or view these profiles and drivers you need to use the 32-bit version of the Data Sources which is found under %Systemdrive%\Windows\SysWoW64\odbcad32.exe

1. In your Windows operating system open **Administrative Tools > Data Sources**.
2. On the **ODBC Data Source Administrator** dialog box, click **Add**.
TIP Click **Add** on either the **User DSN** or **System DSN** tab, whichever is appropriate.
3. On the **Create New Data Source** dialog box, from the **Name** list select the Microsoft dBase Driver (*.dbf).
4. Click **Finish**.
5. On the **ODBC dBASE Setup** dialog box, type in the **Data Source Name** and **Description** for your database.
6. In the **Database** group box, select an appropriate Microsoft dBase version.
7. Check the **Use Current Directory** check box.
IMPORTANT If the **Use Current Directory** check box is not selected, the driver will not be able to find the correct files.
8. Click **OK**.

For further details, see the user's guide for your database platform.

Flow of Activities for Importing Data into SmartPlant Instrumentation

This topic describes the flow of activities for importing data into SmartPlant Instrumentation.

Define an Import Source

You must define a file or database with the data you want to import. For details about supported data sources, see *Database Platform Support* (on page 6).

Create a Link Group

If you intend to use several data sources, you will have to define an import link for each source. Therefore, creating defining import links, create a link group. For details, see *Managing Import Link Groups Common Tasks* (on page 10).

Create an Import Link

Create a link between the data source that you defined and the target table or module of SmartPlant Instrumentation. For details, see *Defining Import Links Common Tasks* (on page 16).

Define Import Link Properties

After creating an import link, you must specify how you want to import the source data associated with the link. For example, you might only want to insert new records into SmartPlant Instrumentation without updating existing data, or you want to import data into more than one <plant> or project. For details, see *Defining Import Link Properties Common Tasks* (on page 24).

Map Source and Target Fields

At this stage, you map the fields in your data source with target table columns in SmartPlant Instrumentation. For details, see *Map Source and Target Fields Common Tasks* (on page 61).

Use Comparison Options

After you have run an import session on a set of data at least once, you can run subsequent sessions by comparing the new rows to be imported with previously imported rows. For details, see *Comparison Options Common Tasks* (on page 73).

Import Data into SmartPlant Instrumentation

If needed, test the import process before importing data. Testing the import process can be useful when testing a single link before carrying out a large batch operation. A test can also give you an indication on the rejected rows and allow you to fix the problem prior to a batch operation. After testing, run the import process. For details, see *Importing Data Common Tasks* (on page 82).

Starting the Import Utility

The Import Utility is automatically installed when selected during SmartPlant Instrumentation setup. However, if the Import Utility was not installed in your computer, you can install it by running the SmartPlant Instrumentation setup and selecting to install the Import Utility.

IMPORTANT

- You must have Domain Administrator access rights to be able to perform import activities.
- If you are importing SmartPlant P&ID data, SmartPlant P&ID must be closed before starting the import session, to ensure that any modifications made to the drawings are properly imported to SmartPlant Instrumentation.

You can start the Import Utility in one of two ways:

- By selecting **Import Utility** from the **Intergraph SmartPlant Instrumentation** program group in the Windows **Start** menu.
- By running an import session using a command-line (see *Run an Import Session from the Command Line* (on page 84)).

Link Groups

A link group allows you to categorize import links according to your requirements and easily find the appropriate link when needed. You create and manage link groups in the **Link Explorer**. The software comes shipped with the **All** link group, which you cannot edit or delete.

Every link must belong to a link group, so if you do not create a group, links that you create automatically appear in the **All** link group. Other link groups that you create are considered user-defined. You can create as many user-defined link groups as you require, edit or delete them when needed, move links from one group to another, duplicate links, or associate the same link with more than one group. Changing properties of such a link in one group results in changing the properties of all instances of this link in all the groups it is associated with. You can only delete a link group together with the links this group contains. Deleting a link group results in deletion of all the group links from the **All** group as well.

You can import data either from a specific link or from all links in the group in batch mode. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority.

Managing Import Link Groups Common Tasks

These tasks deal with creating and managing import link groups, and organizing links into groups in the **Link Explorer** window.

Create a Link Group

Use this procedure to create an empty link group. For details, see *Create a Link Group* (on page 11).

Rename a Link Group

Use this procedure to rename an existing link group, provided that the name you define is unique. you cannot rename the **All** group. For details, see *Rename a Link Group* (on page 11).

Rename a Link in the Link Explorer

Use this procedure to rename an existing link in the **Link Explorer**, provided that the name you define is unique. For details, see *Rename a Link in the Link Explorer* (on page 13).

Rename a Link in the Import Link Window

Use this procedure to rename an existing link after opening this link in the **Import Link** window, provided that the name you define is unique. For details, see *Rename a Link in the Import Link Window* (on page 13).

Prioritize Links in a Link Group

Use this procedure to define or modify the sequence in which the links appear in a group. This sequence determines the link priority. When executing an import session for the entire group, the links are run in the order in which they appear in the group. By default, links in groups are arranged automatically in alphabetical order. For details, see *Prioritize Links in a Link Group* (on page 13).

Duplicate a Link in the Link Explorer

Use this procedure to duplicate an existing link within the same link group by selecting a source link in the **Link Explorer**. You can only duplicate one link at a time. For details, see *Duplicate a Link in the Link Explorer* (on page 12).

Duplicate a Link in the Import Link Window

Use this procedure to duplicate an existing link within the same link group after opening this link in the **Import Link** window. For details, see *Duplicate a Link in the Import Link Window* (on page 12).

Move Links to Another Group

Use this procedure to move one or more link from one group to another. You cannot move links from the **All** group. For details, see *Move Links to Another Group* (on page 14).

Associate the Same Links with Several Groups

Use this procedure to associate the same link or links with more than one group. Changing properties of a link in one group results in changing the properties of all instances of this link in all the groups it is associated with, including the **All** group. In the same way, deleting such a link from a particular group results in deletion of all instances of this link from all the groups it is associated with, including the **All** group. For details, see *Associate the Same Links with Several Groups* (on page 14).

Dissociate Links From a Group

Use this procedure to dissociate one or more links from a group. If a link is not associated with any group, you can still locate it and run it from the **All** group, if required. For details, see *Dissociate Links From a Group* (on page 14).

Delete Links

Use this procedure to delete one or more links that you no longer require. For details, see *Delete Links* (on page 14).

Delete a Link Group

Use this procedure to delete an entire link group with all the links that it contains. For more information, see *Delete a Link Group* (on page 15).

Create a Link Group

1. In the **Link Explorer**, do one of the following:
 - On the toolbar, click  (**New Group**).
 - Right-click anywhere in the **Link list** pane, and then, on the shortcut menu, click **New Group**.
2. Under **Link list**, type a unique name for the link group.

TIP In the link group name string, you can use spaces and special characters if required.

See Also

Link Groups (on page 9)

Import Links (on page 15)

Rename a Link Group

1. In the **Link Explorer**, click the group you want to rename.
2. On the toolbar, click  (**Rename**).
3. Type the new unique name for the group.

NOTE Since groups in the **Link list** are arranged in alphabetical order, renaming a group may result in its moving to a different position in the **Link Explorer**.

See Also

Link Groups (on page 9)

Duplicate a Link in the Link Explorer

CAUTION Links in groups are arranged in alphabetical order. Duplicating a link may result in changing the priority of running links in batch mode. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority. After duplicating a link, you might need to rearrange the order of your links manually. For details, see *Prioritize Links in a Link Group* (on page 13).

1. In the **Link Explorer**, click the group containing the link you want to duplicate.
2. Select the link you want to duplicate and do one of the following:
 - On the toolbar, click  (**Edit Links**).
 - Right-click on the link, and from the shortcut menu click **Edit Link**.
3. On the **Link Definitions** dialog box, do the following:
 - a. In the **Link** box, enter a unique name for the link you want to create by duplicating the existing link.
 - b. If needed, modify the source settings.
 - c. Select **Save as new link**.
 - d. Click **Apply** and then **Close**.

CAUTION We recommend that you do not modify the import method when duplicating a link. This is because the source link properties are also duplicated and might be not applicable for a new link if you change the import method. For example, suppose your source import link properties include multi-tag spec options and the link is assigned to the **Module (multiple tables)** import method. If you change the import method to **Single table**, select a specification table, and save the link under a new name, the multi-tag spec option properties are applied to the new link as well. You cannot manually dissociate these properties from the duplicated link because the multi-tag spec options are disabled on the **Link Properties** dialog box when the link is assigned to the **Single table** method.

4. On the toolbar, click  to display the duplicated link in the link group.

See Also

Link Groups (on page 9)

Import Links (on page 15)

Duplicate a Link in the Import Link Window

CAUTION Links in groups are arranged in alphabetical order. Duplicating a link may result in changing the priority of running links in batch mode. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority. After duplicating a link, you might need to rearrange the order of your links manually. For details, see *Prioritize Links in a Link Group* (on page 13).

1. With the link open in the **Import Link** window, on the toolbar, click  (**Save As**).
2. On the **Save Link As** dialog box, under **Link name**, enter the new unique name for the link.
3. Under **Save options**, select **Save as new link**.
4. Click **OK**.

NOTE The duplicated link automatically appears in the **Link Explorer** in the group to which the source link belongs.

See Also

Import Links (on page 15)

Rename a Link in the Link Explorer

CAUTION Links in groups are arranged in alphabetical order. Renaming a link may result in its moving to a different position in the group. Therefore, if you intend to import data in batch mode, note that the link running order may change. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority.

1. In the **Link Explorer**, click the group in which you want rename a link.
2. Click the link that you want to rename.
3. On the toolbar, click  (**Rename**).
4. Type the new unique name for the link.

Rename a Link in the Import Link Window

CAUTION Links in groups are arranged in alphabetical order. Renaming a link may result in its moving to a different position in the group. Therefore, if you intend to import data in batch mode, note that the link running order may change. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority.

1. With the link open in the **Import Link** window, on the toolbar, click  (**Save As**).
2. On the **Save Link As** dialog box, under **Link name**, enter the new unique name for the link.
3. Under **Save options**, select **Rename current link**.
4. Click **OK**.

See Also

Import Links (on page 15)

Prioritize Links in a Link Group

1. In the **Link Explorer**, in the **Link list** pane, expand a link list in a user-defined group.
 2. To set a particular link as having the highest priority, do one of the following:
 - In the **Link list** pane, drag the appropriate link to the group level.
 - In the right pane, drag the link to the top of the list so that the link that appears at the top moves down and becomes the second link from the top.
- TIP** In the right pane, if the link you want to move up appears right under the first link at the top, move the topmost link down to swap the positions of the two links.
3. Arrange the other links in the required sequence in the group by dragging the link to the appropriate positions.
- TIP** If you have a link that appears right above the link that has the lowest priority and you want to swap the positions of these links, move the higher link down.

Move Links to Another Group

CAUTION Links in groups are arranged in alphabetical order. If the target group already contains links, moving a link into this group may result in changing the priority of running links in batch mode. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority. After moving links, you might need to rearrange the order of your links manually. For details, see *Prioritize Links in a Link Group* (on page 13).

1. In the **Link Explorer**, click a user-defined group containing the links you want to move.
2. In the right pane, while pressing and holding down the **Shift** key, select the links you want to move.
3. Drag the selected links to the target group in the **Link list** pane.

Associate the Same Links with Several Groups

CAUTION Links in groups are arranged in alphabetical order. If the target group already contains links, associating another link with the group may result in changing the priority of running links in batch mode. For batch mode, the Import Utility runs the group links one after another with the link that appears right under the group name in the **Link Explorer** having the highest priority. After associating additional links, you might need to rearrange the order of your links manually. For details, see *Prioritize Links in a Link Group* (on page 13).

1. In the **Link Explorer**, click a group containing the links you want to associate with another group as well.
2. In the right pane, select one or more links (use the **Ctrl** key to select multiple links).
3. Drag the selected links to the target group in the **Link list** pane.

See Also

Import Links (on page 15)

Dissociate Links From a Group

1. In the **Link Explorer**, click the group where you want to dissociate links.
2. Select one or more links in the right pane (press **Ctrl** or **Shift** for multiple selections).
3. On the toolbar, click  (**Dissociate**) to dissociate the selected links from the group.

Delete Links

CAUTION Link deletion is irreversible. When deleting a link, the software permanently removes this link from all link groups it is associated with, including the shipped group **All**. For this reason, you should exercise an extreme caution when deleting links.

1. In the **Link Explorer**, click the group containing the links you want to delete.
2. In the right pane, select links that you want to select (press **Ctrl** or **Shift** for multiple selections).
3. On the toolbar, click  (**Delete**).
4. When prompted, click **Yes** to confirm the deletion.

TIP You can delete links by deleting the entire link group. For details, see *Delete a Link Group* (on page 15).

Delete a Link Group

CAUTION Link group deletion is irreversible. When deleting a link group, the software deletes the links from all other groups they are associated with, including the shipped group **All**. For this reason, you should exercise an extreme caution when deleting link groups.

NOTE Deleting a link group results in deletion of all the group links from the **All** group as well.

1. In the **Link Explorer**, click the group you want to delete.
2. On the toolbar, click  (**Delete**).
3. When prompted, click **Yes** to confirm the deletion.

TIP You can delete individual links without deleting the whole group. For details, see *Delete Links* (on page 14).

Import Links

Before the actual import can take place, you must have a link between the source data and the target table or module of SmartPlant Instrumentation. If you do not have a previously saved link or you do not want to use an existing link, you need to create a new one.

The first step in building a new link is to define the source data using your database tools or a file source. When defining an import link, you need to establish a connection to the source database or file that contains predefined source data. Your import source must contain at least one field, even if you want to specify an import value manually. You either map existing source fields or specify import values manually in the **Import Link** window.

The second step in creating an import link is to specify the import method. The import method can be either **Single table** or **Module (multiple tables)**. The **Single table** method is useful when you need to or to import specific items or update properties of items that already exist in SmartPlant Instrumentation. This method is especially useful when importing wiring data. First, you import your panels into the PANEL table. Then, you import terminal strips into the PANEL_STRIP table and make appropriate associations with the previously imported panels. Then, you import terminals into the PANEL_STRIP_TERM table, and so forth. You can also use the **Single table** method in conjunction with data import into reference tables. The **Module (multiple tables)** method is useful for massive data import. For example, you need to use this method to import multiple tag numbers, loop numbers, supporting table values, and automatically associate appropriate supporting table values to the imported instrument and loops. This method, however, is not useful for wiring data import due to the complexity of wiring connections and parent item – child item relations in SmartPlant Instrumentation.

When creating an import link, you must define a unique link name. If you create several links, you might need to categorize them into link groups. For details, see *Link Groups* (on page 9). You create, rename, delete import links, and associate them with link groups in the **Link Explorer** window. Also, you can move import links between databases or domains. For details, see *Moving Links Between Databases or Domains* (on page 16). It is possible to run import links in batch mode, in order of priorities.

After creating an import link, you need to set various properties for the link on the **Link Properties** dialog box. The properties that appear on this dialog box depend on your import method and target table or module selection. For details, see *Defining Import Link Properties Common Tasks* (on page 24).

IMPORTANT

- If you intend to import a large number of records (more than 400 records) in one import session, you must create a new section in the Intools.ini file called [Rules] and add the following parameter: **disable = y**.

Moving Links Between Databases or Domains

Import links are used per domain. You can move the links you have created to other databases or other domains. This process consists of two stages. First, you transfer the link information to an ASCII file by exporting the links and then you create a group of links from that ASCII file in the target domain by importing the links. You can export and import only a group of links and not an individual link. Hence, if you want to move a single link, you need create a group to which you associate the link.

CAUTIONS

- Make sure that instrument naming convention is the same in the source and target domains. Otherwise, you will not be able to carry out the import process automatically. In this case, you will first need to modify the links of the naming convention of the required part of the name.
- The source and the target domain or database for the links must be of the same version of SmartPlant Instrumentation.

Defining Import Links Common Tasks

The following tasks are used when you define import links.

Create an Import Link for an ODBC Source

This procedure describes the setup for the ODBC platform. For more information, see *Create an Import Link for an ODBC Source* (on page 17).

Create an Import Link for an Oracle Source

Use this procedure to build a new link using a source database platform other than ODBC. To do this you must have access rights to the database server as well as the appropriate database drivers. You must also have the appropriate settings in the configuration files (for example, ini files) and in the Windows registry. For more information, see *Create an Import Link for an Oracle Source* (on page 18).

Create an Import Link for a File Source

Use this procedure to create an import link for a data source that is a predefined file containing tables with table columns and values. For more information, see *Create an Import Link for a File Source* (on page 19).

Define a Data Import Source in Excel Spreadsheets

Use this procedure to define tables, table columns and column values in an Excel spreadsheet. You can then use this Excel spreadsheets as a source for data import. For more information, see *Define a Data Import Source in Excel Spreadsheets* (on page 20).

Prerequisite for Using Microsoft Access as an Import Source

Before you create an import link for a Microsoft Access data source file, you need to perform the following procedure in Microsoft Access file containing the source data. For more information, see *Prerequisite for Using Microsoft Access as an Import Source* (on page 20).

Using the Link Explorer Window

You use the **Link Explorer** window to move and copy links. For more information, see *Using the Link Explorer Window* (on page 21).

Change Link Source Paths

Use this procedure to change the path or name of the source file of an existing link when you need to update the source path. You can change the source path of a single link or you can set one default folder for all your links in that group. For more information, see *Change Link Source Paths* (on page 22).

Export Links

Use this procedure when moving a link or exporting a group of links to another database or domain. When you export a group of links you transfer the information about a group of links to an ASCII file which has the .imp extension. You can then use the exported links in other domains or databases. The link information is saved to an ASCII file which you can use for import. For more information, see *Export a Group of Links* (on page 22).

Import Links

Use this procedure to import the link or group of links you exported. You can use a file with the .imp extension to create a group of links based on the information you have saved in this file. For more information, see *Import Links* (on page 23).

Create an Import Link for an ODBC Source

Prerequisites

- If you need to connect to a domain residing in another Sybase Adaptive Server Anywhere database, make sure you created an ODBC profile for connection to the source database. You can use the Internal Setup Utility options to create ODBC profiles for Sybase Adaptive Server Anywhere. The ODBC profiles that you create become available for selection in the Import Utility.
- If you need to connect to a domain residing in another SQL Server database, make sure you created an ODBC profile for connection to the source database. You cannot use existing profiles that are available for selection in the Import Utility. When creating a new ODBC profile for SQL Server, make sure the new profile name is unique in the Windows registry of the machine where you run the Import Utility.

NOTE SmartPlant Instrumentation supports Microsoft dBase Driver for .dbf files, and Microsoft Text Driver for .txt and .csv files. You can select the driver you require using the ODBC Data Source Administrator in your Windows Administrative Tools.

1. Do one of the following:
 - Click **Actions > New Group**.
 - Click .
 - In the link list, select an existing link group.
2. Do one of the following:

- Click .
 - Click **Actions > New Link**.
3. On the **Link Definitions** dialog box, under **Import method**, click **Single table** or **Module (multiple tables)** and select the appropriate target table or module from the list.

IMPORTANT You can import data only into a target table which has a table definition (for example, a table which has a correct definition of a primary key, foreign keys, and reference tables). If you import data into a target module, **all** the tables in the target module must have a table definition.
 4. Under **Source**, from the **Database type** list, select **ODBC** as the source database platform.
 5. From the **ODBC profile** list, select the required database profile or a file that contains source table definitions.

TIP Your selection affects the way you connect to the SQL data source and the dialog box options change accordingly.
 6. Do one of the following:
 - If you selected a database profile, specify the user name and password for connecting to the source database and click **Connect**; then, from the **Table** list, select a table from which you want to import data.
 - If you selected a data source file, beside **File name and path**, click **Browse** and specify the data source file.

TIP If you are creating a new link on the basis of an existing link, select **Save as new link**.
 7. Click **Apply** and then **Close**.
 8. Click  to display the link you defined in the **Link Explorer**.

Create an Import Link for an Oracle Source

1. Do one of the following:
 - Click **Actions > New Group**.
 - Click .
 - In the link list, select an existing link group.
2. Do one of the following:
 - Click .
 - Click **Actions > New Link**.
3. On the **Link Definitions** dialog box, under **Import method**, select **Single table** or **Module (multiple tables)** and select the appropriate target table or module from the list.

IMPORTANT You can import data only into a target table which has a table definition (for example, a table which has a correct definition of a primary key, foreign keys, and reference tables). If you import data into a target module, **all** the tables in the target module must have a table definition.
4. Under **Source**, from the **Database type** list, select a source Oracle version.
5. Under **Server name**, type the server name where the source Oracle database resides.
6. Under **User name** and **Password**, provide logon information for connection to the source Oracle database.
7. Click **Connect** to establish a connection to the selected Oracle database.
8. From the **Table** list, select a table from which you want to import data.

TIP If you are creating a new link on the basis of an existing link, select **Save as new link**.

9. Click **Apply** and then **Close**.
10. Click  to display the link you defined in the **Link Explorer**.

See Also

Target Table Definition (on page 43)

Create an Import Link for a File Source

1. Do one of the following:
 - On the **Actions** menu, click **New Group** (or click ) to create a new link group.
 - In the link list, select an existing link group.
2. Do one of the following:
 - Click .
 - Click **Actions** > lick **New Link**.
3. On the **Link Definitions** dialog box, under **Import method**, click **Single table** or **Module (multiple tables)** and select the appropriate target table or module from the list.

CAUTION You can import data only into a target table which has a table definition (for example, a table which has a correct definition of a primary key, foreign keys, and reference tables). If you import data into a target module, all the tables in the target module must have a table definition. If you select a target table which does not have a table definition or has an incorrect table definition, an appropriate message will be displayed. In this case you will have to select another target table or modify the table definition. To learn more about setting the table definition, see *Target Table Definition* (on page 43).
4. Under **Source**, from the **Database type** list, select **ODBC** as the source database platform.
5. From the **ODBC profile** list, select the appropriate data source file type.
6. Beside **File name and path**, click **Browse**.
7. On the **Select File** dialog box, select the source file and then, do one of the following:
 - In the data source file does not have table definitions, click **Open** to display the file name and path on the **Link Definitions** dialog box.
 - If the file that you selected has table definitions, for example, an Excel spreadsheet, on the **Enter Table Name** dialog box, type the name of the source table in upper case, as it appears in the data source file, and then click **OK** to display the file name and path on the **Link Definitions** dialog box.

TIP If you are creating a new link on the basis of an existing link, select **Save as new link**.
8. Click **Apply** and then **Close**.
9. Click  to display the link you defined in the **Link Explorer**.

See Also

Target Table Definition (on page 43)

Define a Data Import Source in Excel Spreadsheets

1. With your Excel worksheet open, in the top cell row, define table column names without spaces, for example, **instrument_tag_number**, **service**, and so forth.

IMPORTANT You must not use underscore ('_') in column names.

2. In the cells under the table column names, define the column values, for example, **101-FT - 100/A**, **Flow**, and so forth.

TIPS

- The table or column names that you define do not have to match the table column names in SmartPlant Instrumentation.
 - Make sure that the values you enter in the cells comply with the data format used in SmartPlant Instrumentation. For example, when defining instrument tag numbers, you must use the naming convention defined in SmartPlant Instrumentation.
3. Select the cells that you want to include into a table.
 4. Click **Insert > Name > Define**.
 5. In the **Name in workbook** box, type the table name in upper case, for example, **SOURCE_INSTRUMENTS**.
 6. Click **Add**.
 7. Click **OK** to return to your Excel spreadsheet and repeat this procedure for all other tables that you require.
 8. Save the spreadsheet.

See Also

Set Properties for an Excel Data Source (on page 31)

Prerequisite for Using Microsoft Access as an Import Source

1. In Microsoft Access, open a data source file and click **Tools > Options**.
2. On the **View** tab, select the **System objects** check box and click **OK**.
3. Click **Tools > Security > User and Group Permissions**.
4. Under **Object Name**, select **MSysObjects**.
5. Select the **Read Data** check box and click **OK**.

Using the Link Explorer Window

You can perform the following actions in the **Link Explorer** window.

To do this...	With the mouse...	From the keyboard...	Notes
Move a link	Select a link in the left pane and drag the link to the new location	Press Ctrl+ X to cut the selected link; press Ctrl+ V to paste in the new location	The link always appears below the position you drag it to; drag to the group to make it the first link in the group
Copy a link	Select a link in the left pane and hold down Ctrl while dragging the link to the new location	Press Ctrl+ C to copy the selected link; press Ctrl+ V to paste in the new location	The link always appears below the position you drag it to; drag to the group to make it the first link in the group
Move a group of links	Select a group in the left pane and it to the new location	Press Ctrl+ X to cut the selected group; press Ctrl+ V to paste in the new location	If one or more of the links already exists in the target, it is not deleted in the source
Copy a group of links	Select a group in the left pane and hold down Ctrl while dragging it to the new location	Press Ctrl+ C to copy the selected group; press Ctrl+ V to paste in the new location	
Move multiple links	In the right pane, hold down Shift or Ctrl while selecting the required links and drag to the new location in the left pane		The links always appear below the position you drag it to; drag to the group to make it the first link in the group
Copy multiple links	In the right pane, hold down Shift or Ctrl while selecting the required links and drag to the new location in the left pane while holding down Ctrl		The links always appear below the position you drag it to; drag to the group to make it the first link in the group

To do this...	With the mouse...	From the keyboard...	Notes
Change the link order	Drag links up or down in the group	Press Ctrl+ X to cut the selected link; press Ctrl+ V to paste in the new location	The link always appears below the position you drag it to; drag to the group to make it the first link in the group

See Also

Dissociate Links From a Group (on page 14)

Delete a Link Group (on page 15)

Change Link Source Paths

1. In the **Link Explorer**, select the required group and click  to expand the group and display its links.
2. On the toolbar, click  (**Edit Links**).
3. On the **Link Definitions** dialog box, click **Browse**.
4. Navigate to the required source file and click **Open**.
5. Click **Close** to close the **Link Definitions** dialog box.

TIP You can change the source path only if the platform is a database file, for example, dBase, Excel, ASCII, and so forth.

Specify a New Default Folder for All Links

1. In the **Link Explorer**, do one of the following:
 - Click  (**Folder**).
 - Click **Actions > Folder**.
2. In the **Default Source File Folder** dialog box, click **Browse**.
3. Navigate to a file in the required folder and click **Open**.
4. Click **Apply**.
5. To undo the current default folder settings, click **Clear** next to the default path.
6. Click **Close**.

TIP You can change the source path only if the platform is a database file, for example, dBase, Excel, ASCII, and so forth.

Export a Group of Links

1. Click **Service > Export Links**.
2. In the **Export Link Groups** dialog box, select one or more groups that you want to export.
3. Click **OK** and, on the dialog box that opens, do the following:
4. Type the filename of the link file name (you do not have to add the .imp extension).
5. Navigate to the required location where you will save the link file.
6. Click **Save** to save the link file.

See Also

Moving Links Between Databases or Domains (on page 16)

Import Links

1. Click **Service > Import Links**.
2. In the **Open File** dialog box, navigate to the required ASCII file with the .imp extension which you want to use for import and click **OK**.
3. When prompted, click **Yes** to import the group of links from the .imp file.
4. On the **Database Table Definition** dialog box, select the **Import link table definition** check box to import the table definition saved in the group of links as well as the links themselves, or clear the check box to import only the group of links.
5. Under **Duplicate table definition names**, do one of the following:
 - Click **Create new** to import the link table definition if the imported table definition name is the same as the current table definition. This way, the Import Utility appends a \$ sign to the imported table definition name. For example, Process Data will be renamed as Process Data\$.
 - Click **Skip** to skip the import of the table definition if the current table definition name is the same as the imported table definition.
6. Click **OK** to import the group of links.

TIP If the links groups or links that you import already exist, the software appends a \$ sign to the imported link or group name.

See Also

Moving Links Between Databases or Domains (on page 16)

Import Link Properties

Import link properties are various parameters that influence the import process when you run the link. You define and manage import link properties using various options on the tabs of the **Link Properties** dialog box. By selecting properties on the **General** tab, you control various features which influence the import setup process.

The available options depend on whether the current link is assigned to the **Module (multiple tables)** or **Single table** import method. Some of the displayed options depend on the specific module that you selected for the link. When duplicating an import link, all the source import link properties are retained.

Defining Import Link Properties Common Tasks

The following tasks are used when you setting the import link properties.

Open Link Properties

Use this procedure to display the **Link Properties** dialog box either from the **Link Explorer** or **Import Link** window. For more information, see *Open Link Properties* (on page 26).

Set Properties for Handling Mismatched Data

Use this procedure to determine how the software handles imported source rows with invalid empty foreign key columns that are defined as NOT NULL but contain no value. For more information, see *Set Properties for Handling Mismatched Data* (on page 26).

Set Import Mode Parameters

Use this procedure to perform the following operations:

- Determine the way SmartPlant Instrumentation treats identical source and target rows by setting the appropriate parameters in the **Import mode** tab.
- Determine how the Import Utility updates target rows during the import process.
- Select source and target keys for the Import Utility to use to refresh the target data during the import process. This option is available to you only if the source and target tables have been already used in a previous import session.

For more information, see *Set Import Mode Parameters* (on page 26).

Specify a Filtering Condition

Use this procedure to define a filtering condition which will be used by Import to selectively import data from the source table. The filtering condition can contain any combination of the following:

- Source table columns
- Operators or functions
- Alphanumeric values

For more information, see *Specify a Filtering Condition* (on page 27).

Enable Reference Tables for Import

Use this procedure to enable data insertion into the target reference tables during the import process whenever data exists in the source table but it is missing in the target table. As a rule of thumb, you must always import data into reference tables before importing data into the tables they refer to. You can also control which reference table columns are displayed in the **Import Link** window by selecting a browser view created in SmartPlant Instrumentation. You can perform this procedure only when using the **Single table** import method. For more information, see *Enable Reference Tables for Import* (on page 28).

Set the Tag/Loop Parameters

Use this procedure to determine the way the Import Utility handles the naming conventions of the source data during the import process. This procedure is possible only if the target table or module you selected requires naming conventions, for example, COMPONENT table, LOOP table, Instrument Index module, and so forth. For more information, see *Set the Tag/Loop Parameters* (on page 29).

Set Custom Parameters for the Module Import Method

Use this procedure to show in the **Import Link** window only those table columns that are used in a specific browser view style defined in the Browser module. This way, you can use these columns in creating the current import link. You can perform this procedure only if your import link is assigned to the **Module (multiple tables)** import method and you selected to import data into one of the following modules: Instrument Index, Process Data – Line, or Dimensional Data for Piping. For more information, see *Set Custom Parameters for the Module Import Method* (on page 30).

Set Column Display for the Module Import Method

When your link is assigned to the **Module (multiple tables)** import method, you can use this procedure to set the Import Utility to display all target module table columns in the **Import Link** window. By default, when opening an import link assigned to the **Module (multiple tables)** import method, the Import Utility only retrieves those columns that appear in a special hard-coded list and displays them in the **Import Link** window. The special list serves two purposes:

- To shorten the list of table columns displayed in the **Import Link** window.
- To display data field names instead of the table column names used in the database.

NOTE You cannot perform this procedure when importing data into the Specifications module. For more information, see *Set Column Display for the Module Import Method* (on page 30).

Set Properties for an Excel Data Source

Use this procedure to if your data source is an Excel file and there are source fields containing more than 256 characters. For more information, see *Set Properties for an Excel Data Source* (on page 31).

Refresh Previously Imported Data

Use this procedure to keep the tables that you have already used in a previous import session up to date by refreshing them. To refresh tables you previously imported, you need to select the same source and target data as you did in the previous import session. Then you select the appropriate source and target refreshing keys which are the source and target table columns according to which contents the target data will be refreshed during the import process.

If the Import Utility detects a change in the selected source refreshing key contents (in comparison to the selected target refreshing key contents), the target table column contents will be updated accordingly. For more information, see *Refresh Previously Imported Data* (on page 31).

Open Link Properties

- To open the **Link Properties** dialog box, do one of the following:
 - Click .
 - Click **Actions > Properties**.

Set Properties for Handling Mismatched Data

1. Open the **Link Properties** dialog box.
2. On the **General** tab, under **Undefined NOT NULL fields**, do one of the following:
 - Select **Use default value** to set any reference columns values in the target table to zero during the import process if these columns do not appear in the appropriate reference table.

TIP Selecting the **Use default value** option overrides any selections you make in the **Default** column on the **Target Table Definition** dialog box. To learn how to use the **Target Table Definition** dialog box, see *Target Table Definition* (on page 43).
 - Select **Reject rows** to set the Import Utility to reject all source rows that contain reference columns that do not appear in the appropriate reference table during the import process.

See Also

Common Error Messages (on page 113)

Set Import Mode Parameters

1. On the **Link Properties** dialog box, click the **Import Mode** tab.
2. Under **Target database import mode**, do one of the following:
 - Select **Insert and update** to enable the Import Utility to insert new source rows and update existing target rows during the import process.
 - Select **Insert** to prevent the Import Utility from updating target rows and to enable insertion of only **new** source rows in the target domain during the import process.
 - Select **Delete** to delete existing rows in the target domain during the import process.
 - Select **Move** to move the rows in the target domain to a different <unit> in the same domain.

NOTES

- The **Delete** and **Move** modes are only available when using the **Single table** import method.
 - If you selected **Insert and update**, the Update operation is carried out automatically whenever a source row contains the same key definition as the target row.
3. If you chose the **Insert and update** option in step 2, under **Target database update condition**, select any combination of the following check boxes:
 - a. **If the source contains a NULL value**
 - Select to overwrite the target table column even if the corresponding source table column contains a NULL value.
 - Clear to skip source table columns that contain a NULL value.
 - b. **If the source contains a space or a zero value**

- Select to overwrite the target table column even if the corresponding source table column contains a space value or a zero value.
- Clear to skip source table columns that contain a space value or a zero value.

TIPS

- Some database drivers interpret spaces in a source table column as a NULL value. To avoid incorrect overwriting of data in the target, it is highly recommended that you select both or neither of the above two check boxes.

When inserting NULL values for table columns of data type **String** that can normally accept a NULL value, you can specify the insertion of a single space instead of NULL. To do so, in the Intools.ini file, under the [Import] section, type the line:

FillSpace=Y

c. **Do not insert**

- Select to skip inserting source rows that do not exist in the target table.
- Clear to insert source rows that do not exist in the target table.

See Also

Target Table Definition (on page 43)

Refresh Previously Imported Data (on page 31)

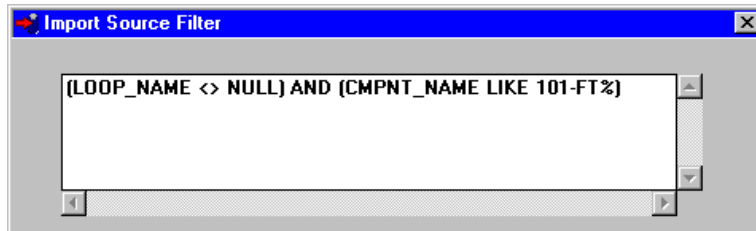
Specify a Filtering Condition

1. On the **Link Properties** dialog box, click the **Source** tab.
2. Select **Filter the source table** to enable filtering during the import process.
3. Click **Modify** to open the **Import Source Filter** dialog box.
4. To create a filtering condition, do one or more of the following:
 - In the **Source table columns** data window, double-click the table column that you want to add to the filter condition in the data window.
 - Under **Operators and functions**, click the appropriate operator or function buttons to add the appropriate operator or function to the filtering condition.
 - Under **Operators and functions**, select the desired SQL function from the appropriate list. Then right-click the selected SQL function to be applied in the filter condition.
 - In the **Import Source Filter** dialog box, type the appropriate expression. You can also add this expression to the filtering condition already displayed in the **Import Source Filter** data window.

TIPS

- The **Filter** feature provides you with various built-in operators and functions. For details, see *Built-In Operators and Functions* (on page 58). The built-in operators and functions are those used in the WHERE SQL statement. See your database platform manual to learn more about database statements.
 - The **Filter** feature also provides you with special SQL functions, which are native to the source database. For details, see *SQL Functions Native to the Source Database* (on page 60).
5. Repeat step 4 to add as many table columns, operators, functions and values as required.

The new condition appears in the window of the **Import Source Filter** dialog box, for example:



6. To check the filter condition syntax, click **Verify**.
An appropriate message is displayed, notifying you that:
 - The condition in the data window is valid – in this case the message also indicates the number of rows which match the condition.
 - The condition in the data window is invalid – in this case you can correct the condition and try again.
7. To view the way the filtering condition affects the source data, click **View Source**.
8. Click **OK** to close the **Import Source Filter** dialog box and return to the **Source** tab where your condition appears in the data window.
TIP You can disable the current filtering condition without deleting it. To do this clear **Filter the source table** after you define a condition.
9. Under **Associate source tables**, select **Apply** to associate additional source data with the source data that you selected when you started this import session. To make the source data definitions, click **Define**. See *Associate Additional Source Data* (on page 57) to learn how to do this.
10. Under **Process function**, select **Assign** to assign SmartPlant Instrumentation process functions to the imported data based on their instrument types. To make the source data definitions, click **Define**. For details, see *Associate Source Fields with Existing Instrument Types* (on page 92) or *Set Source Fields as Instrument Type Fields* (on page 91).

See Also

Viewing the Source Data (on page 55)

Working with Source Data (on page 55)

Enable Reference Tables for Import

IMPORTANT The link for which you want to enable reference tables must be assigned to the Single table import method.

1. Select a link and open the **Link Properties** dialog box.
2. On the **General** tab, select **Insert data into reference tables**.
3. Click the **Style** tab and do the following:
4. Under **Browser view**, select the browser view whose fields you want to display when you open the current link in the **Import Link** window.
5. Click **Style Preview** to display the list of data field names and table columns defined for the selected browser view style.
6. Click **Select View** to apply the style settings for the current link.

TIPS

- You can only select one browser view.
- If you click **Clear** to clear the browser view selection, or select the **Display all fields** check box, when you open the current link in the **Import Link** window, the software

displays all columns of all the reference tables as they are defined in the database. Selecting the **Display all fields** check box disables browser view style selection options.

- The browser view list contains all browser views defined in SmartPlant Instrumentation. You can define a new browser view in SmartPlant Instrumentation if you find no suitable browser view for the current import link.
7. Click **OK**.

Set the Tag/Loop Parameters

1. On the **Link Properties** dialog box, click the **Tag/Loop** tab.
2. Do one of the following:
 - Select **Define the naming conventions** in the link to enable the Import Utility to define the naming conventions structure automatically by extracting the naming conventions structure from the current link.
 - Clear **Define the naming conventions** in the link to define the naming convention structure manually by entering a naming convention string in the **Define Tag Name Structure** dialog box and/or the **Define Loop Name Structure** dialog box.
3. If you cleared the check box in the previous step, do one of the following:
 - Select **Redefine the naming convention** to redefine links for the tag/loop naming conventions parts of the source table.
 - Clear **Redefine the naming convention** to use the current naming conventions without redefining their links.

TIP Instrument conventions are defined in the Administration module. If you select to redefine the naming conventions, you need to assign new values to the instrument tag segments.

4. Select **Validate tag and loop segments** to verify the following during the import process:
 - Whether the instrument type values of the imported tags in the COMPONENT table exist in the Instrument Type table (COMPONENT_FUNCTION_TYPE).
 - Whether the loop function values of the imported loops in the LOOP table exist in the Loop Function table (LOOP_FUNCTION).
 - Whether the measured variables of the imported loops in the LOOP table exist in the Loop Process Variable table (LOOP_PROC). Note that selecting this option slows down the import process.

CAUTION **Validate tag and loop segments** is selected by default, thus enabling the validation check of the imported tags and loops before transferring data. It is recommended you do not clear this box to avoid import failure due to missing data.

5. Do one of the following:
 - Select **Use the loop reference data** to also import loop reference data into the COMPONENT table during the import process.
 - Clear **Use the loop reference data** to disregard any loop reference data during the import process.

CAUTION To prevent import failure, clear **Use Loop reference data** if the imported COMPONENT table contains empty loop reference columns.

6. If you selected in the beginning of the current import session to import into the Instrument Index module, the **Use Tag data** check box appears in the **Tag/Loop** tab folder. In this case, do one of the following:

- Select the check box to include source tag number data from supporting tables in the current import. You will need to redefine the naming conventions for all target <units> in the Administration module before you start the import process.
- Clear the check box to exclude tag supporting table data from the current import session.

See Also

Define Links for Naming Conventions (on page 63)

Set Custom Parameters for the Module Import Method

1. On the **Link Properties** dialog box, click the **Custom Fields** tab.
 2. To show the custom fields of a line style in the **Import Link** window, under **Line**, do the following:
 - a. Select **Use style for line** to include the custom fields of the selected style in the **Import Link** window.
 - b. From the list, select the browser view style whose custom fields you want to show in the **Import Link** window.
 3. To show the custom fields of an equipment style in the **Import Link** window, under **Equipment**, do the following:
 - a. Select **Use style for equipment** to include the custom fields of the selected style in the **Import Link** window.
 - b. From the list, select the browser view style whose custom fields you want to show in the **Import Link** window.
 4. To show the custom fields of a loop style in the **Import Link** window, under **Loop**, do the following:
 - a. Select **Use style for loop** to include the custom fields of the selected style in the **Import Link** window.
 - b. From the list, select the browser view style whose custom fields you want to show in the **Import Link** window.
 5. To select the dimensional group to be used in the **Import Link** window for importing data to the Dimensional Data for Piping module custom fields, under **Select dimensional group for custom name**, select **Apply** to enable a selection to be made from the list, and then from the list, select the browser view style whose custom fields you want to show in the **Import Link** window. The following options are available:
 - **Computed group name** — Automatically creates the source for the **Dimensional Group Name** field in the **Import Link** window, using the group from the COMPONENT_DIMENSIONAL table to which the tag defined in the link belongs.
 - **All Groups** — Allows you to import data for all custom fields in the module. The **Dimensional Group Name** section in the **Import Link** window consists of two table columns: **Dimensional Group CAD Code** and **Dimensional Group Description**. With this option selected, you can enter an existing group or a new group for the source name.
- TIP** All the custom fields are displayed in the **Import Link** window and are assigned sequential numbers.

Set Column Display for the Module Import Method

IMPORTANT The link for which you want to enable reference tables must be assigned to the **Module** (multiple tables) import method.

1. Select a link and open the **Link Properties** dialog box.

2. Click the **Style** tab.
3. Do one of the following:
 - Select the **Display all fields** check box to display in the **Import Link** window all the pertinent table columns of the target module.
 - Clear the **Display all fields** check box to display in the **Import Link** window only those table columns that are included in the hard- coded list.

TIP Browser view selection options on the **Style** tab are only available when the import link is assigned to the Single table import method.
4. Click **OK**.

Set Properties for an Excel Data Source

IMPORTANT Make sure your Excel import source is defined correctly. For details, see *Define a Data Import Source in Excel Spreadsheets* (on page 20).

1. Select a link and open the **Link Properties** dialog box.
2. On the **General** tab, clear the **Ignore duplicated source rows** check box.

IMPORTANT You must clear this check box if your Excel file has source fields containing more than 256 characters. If this check box is selected, the software only imports the first 256 characters from such fields. This is a limitation of Excel drivers.
3. Click **OK**.

Refresh Previously Imported Data

1. On the **Link Properties** dialog box, click the **Import Mode** tab.
2. Click **Insert and update** to enable refreshing.
3. Under **Refresh from source**, select **Apply**.
4. Click **Parameters**.
5. On the **Refresh Parameters** dialog box, under **Target**:
 - a. From the **Table name** list, do one of the following:
 - Select the appropriate target table.
 - Accept the given default value (the current target table).

TIPS

 - The target tables which are available to you in the **Target** section **Table** list depend on your target data **type** that you selected in the beginning of the current import session:
 - If you selected to import data into a specific table, only that target table would appear in the **Table** list.
 - If you selected to import data into a module, all the tables which are associated with that target module would appear in the **Table** list.
 - b. From the **Refresh key** list, do one of the following:
 - Select the target table column to refresh during the import process.
 - Accept the given default value (the current target table).
6. Under **Source**:
 - a. From the **Table** list, select the appropriate source table. This box is empty by default.
 - b. From the **Refresh key** list, select the source table column to refresh from during the import process. This box is empty by default.

7. Select **View saved parameters** to automatically select the last saved refreshing parameters.
TIP If you click **Delete**, you are prompted to delete the last saved refreshing parameters.
8. Click **Save** to save the refreshing parameters you currently selected in the **Refresh Parameters** dialog box.
9. When prompted to confirm the new selection, do one of the following:
 - Click **Yes** to overwrite the last saved refreshing parameters and return to the **Link Properties** dialog box.
 - Click **No** to return to the **Refresh Parameters** dialog box without overwriting the last saved refresh parameters.**TIP** If you enable the data refresh option or overwrite the last saved refreshing parameters, you are prompted to use data refreshing or overwrite the existing target data during the current import session.

Link Properties Dialog Box

This dialog box enables you to define various properties for the current link. The properties that you define influence the import process when you run the link. You define and manage import link properties using various options on the tabs of the **Link Properties** dialog box. The available options depend on whether the current link is assigned to the **Module (multiple tables)** or **Single table** import method. Some of the options are only available if you assign the import link to a specific module. When duplicating an import link, all the source import link properties are retained.

General Tab (see "*General Tab (Link Properties Dialog Box)*" on page 33)

Import Mode Tab (see "*Import Mode (Link Properties Dialog Box)*" on page 34)

Tag/Loop Tab (see "*Tag/Loop Tab (Link Properties Dialog Box)*" on page 36)

Source Tab (see "*Source Tab (Link Properties Dialog Box)*" on page 37)

Comparison Tab (see "*Comparison Tab (Link Properties Dialog Box)*" on page 38)

Import Level Tab (see "*Import Level Tab (Link Properties Dialog Box)*" on page 39)

Specs Tab (see "*Specs Tab (Link Properties Dialog Box)*" on page 39)

Custom Fields Tab (see "*Custom Fields Tab (Link Properties Dialog Box)*" on page 40)

Style Tab (see "*Style Tab (Link Properties Dialog Box)*" on page 42)

Multi-Form Tab (see "*Multi-Form Tab (Link Properties Dialog Box)*" on page 43)

Table Definition — Opens the **Target Table Definition** dialog box where you can view and modify the target table definition.

General Tab (Link Properties Dialog Box)

The options on the **General** tab allow you to set general properties for the import link.

General parameters

Generate rejected data report — Allows you to create a report of the rows rejected while importing your data. Selecting this check box may slow down the import process if any rejected rows are found.

Import to supporting tables only — Restricts the Import Utility to insert data only into the SmartPlant Instrumentation supporting tables, that is, tag and loop data is not imported. Selecting this option disables the **Tag/Loop Parameter** settings. This check box is available only if you selected the **Module** import method on the **Link Definitions** dialog box.

Insert data into reference tables — Allows the software to insert the imported data into reference tables when this data is missing in the target table. This check box is available only if you selected the **Single table** import method on the **Link Definitions** dialog box.

Messages off — Select this option to cancel the display of messages during the import process.

Ignore duplicated source rows — Reduces all source rows to one if they contain field values which already exist in other source rows.

IMPORTANT

- If your data source is an Excel file and there are source fields containing more than 256 characters, you must clear the **Ignore duplicated source rows** check box. Otherwise, the software only imports the first 256 characters from such fields. This is a limitation of Excel drivers.

Use reserved symbols with import — Allows you to do the following:

- Check the source fields for a reserved symbol such as single quote.
- Correct the target fields so that an SQL statement can be run after the import process is completed.

NOTE

- Selecting this check box slows down the import process to some extent.

Match case — Makes matching of source and target data values case sensitive. For example, if the value of a panel name in the source is **ABC**, and in the target it is **Abc**, with the check box selected, the panel name does not exist in the target database, because the cases do not match. With the check box cleared, no check is made for the case match, so the value of the panel name is based on the string only, and in this example, it exists in the target. Note that selecting this check box improves the import performance and it is recommended to select it whenever possible.

Undefined NOT NULL fields

Use these options to define the way the Import Utility deals with data imported into a not null field (that is, a field that is required to contain some value) if that data does not match existing SmartPlant Instrumentation data. Selecting one of these options determines how this mismatched data is imported.

Use default value — Sets the software to use the default value (zero) for the rows that contain reference fields that are undefined and that are not NULL. This situation can occur if you do not import data into the appropriate reference table. Selecting this option overrides any selections you make in the **Default** column in the **Table Definition** dialog box.

Reject rows — Sets the software to reject the source row if it contains reference fields that are undefined and that are not NULL. This situation can occur when importing an instrument tag and the imported manufacturer ID number does not match any of the existing manufacturers defined in SmartPlant Instrumentation.

Import revisions — Allows you to import revision data from the source database. This check box is available only when importing data into the Process Data module. If you select this option, you must define the link for the **REVISION** table in the **Import Link** window.

Use custom drawing names — Replaces the default document numbers with your own customized numbers. These numbers must be unique on the <plant> level. Clearing this check box allows you to use default document numbers. This check box is available only when importing data into the Process Data module.

Create calculation sheet — Creates a calculation data sheet for every tag that does not have a calculation sheet, and updates all the existing calculation sheets using the imported data. The calculation data is obtained from the source database according to the link that you define in when importing data to the module in the **Import Link** window. Selecting this option also creates a calculation revision record for the source tag associated with the new calculation sheet. You must define the link for the REVISION (Calculation) table in the **Import Link** window. This check box is available only when importing data into the Process Data module but not available for the import of line, level, and pressure data.

Create complementary elements

These options are only available when importing data into the Instrument Index module or instrument index-related table. Select the **Create** check boxes beside the complementary elements you want to create during the import process. Some elements, such as document numbers, are created in the target database while for other elements (for example, wiring data), only the appropriate connections between the relevant elements are established.

Import Mode (Link Properties Dialog Box)

The options on the **Import Mode** tab allow you to set properties for handling source data for the current link. You can determine how the transfer of the source data affects the target data by specifying one of the following:

- Insert new data and overwrite the existing data.
- Insert new data and reject the existing data.
- Delete existing data.
- Move existing data within the same target domain.

If you select to insert and update the target data, you can also set the conditions under which identical source and target data will be overwritten.

Target database import mode

Select one of these buttons to determine the data transfer mode.

Insert and update — Inserts new source data and overwrite the target rows that are identical to the source rows. The Import Utility will insert and update the target according to the three options that you select from the **Target database update conditions** group box.

Insert — Does not overwrite the target rows during the import process. This means that the Import Utility will only insert new source rows into the target domain and reject existing ones. Selecting this button disables the three check boxes in the **Target database update conditions** group box.

NOTE

- If you are importing a value for which the number of characters exceeds the maximum allowed, the Import Utility truncates the extra characters in the target field in the SmartPlant Instrumentation database. If, as a result of truncating the value, the string is identical to an existing value in the database, the Import Utility rejects the import if the value is required to be unique and the import mode in the import link properties is set to **Insert**.

Delete (available only when the link is assigned to the **Single table** import method) — Deletes existing data according to your settings in the **Import Link** window.

Move (available only when the link is assigned to the **Single table** import method) — Moves specified target data within the same target domain to another plant hierarchy item. You specify the pertinent plant hierarchy items in the **Import Link** window.

Target database update conditions

Use these options to set the conditions under which **Import** will overwrite existing target rows during the import process and whether to include associated tag numbers when deleting loop numbers.

Update for source containing a NULL value (available only if **Insert and update** is selected) — Select this option to overwrite all target fields even if the source fields contain a NULL value. Clear this check box to skip source fields which contain a NULL value.

Update for source containing a space or a zero value (available only if **Insert and update** is selected) — Select this option to overwrite all target fields if the source fields contain a space or a zero value; also when changing data to a zero or space. Clear this check box to skip source fields which contain a space or a zero value.

Do not insert (available only if **Insert and update** is selected) — Select this option not to insert source rows which do not exist in the target table. Clear this check box to insert source rows which do not exist in the target table.

Deletion option

Delete associated tags — Select this option to delete all tag numbers associated with deleted loop numbers. This option is only available when importing loop numbers and if you selected **Delete** in the **Target database import mode** group box.

Refresh from source

Use these options to refresh the tables you imported previously. Remember that if you want to keep your previously imported tables, you need to select the same source and target data as you did in the previous import session. Then you select the appropriate source and target refresh keys. The target data is refreshed during the import process according to the content of the source and target refresh keys. If the Import Utility detects a change in the selected source refresh key contents (in comparison with the selected **target** refresh key content), the target field content is updated accordingly.

IMPORTANT

- If the data was imported previously with this option selected, the same data records is refreshed from the source in subsequent import sessions even if the primary key in the target was changed.

The options below are available only if **Insert and update** in the **Target database update conditions** group box is selected.

Apply — Allows you to set the Import Utility to refresh the target data according to the refresh parameters you set in the **Refresh Parameters** dialog box.

Parameters — Opens the **Refresh Parameters** dialog box, where you set the import refresh parameters.

Tag/Loop Tab (Link Properties Dialog Box)

The options in this tab are available only if the target table or module requires naming conventions, for example **COMPONENT** table or **Instrument Index** module. These options enable you to determine the way the Import Utility handles the naming conventions of the source data during the import process:

- Verify that the imported tags contain a valid instrument type value.
- Verify that the imported loops contain valid measuring variable values.
- Include loop reference data during the import process.
- Include tag number data from supporting tables when importing into the **Instrument Index** module.

You can also determine whether to insert leading zeros in the numeric segments of the tag and loop name string. Note, however, that this is a global Import Utility parameter that you set on the **Preferences** dialog box.

Define the naming conventions in the link — Select this check box to let the Import Utility define the naming conventions using a link. You will define link between the source and target fields used for tag and loop number naming conventions in the **Import to Table** or **Import to Module** dialog box.

Clear this box to define the naming conventions by entering a naming convention string in the **Define Tag Name Structure** dialog box and/or in the **Define Loop Name Structure** dialog box.

Redefine the naming conventions — Select this check box to redefine the links for the tag/loop naming convention parts of the source table.

Clear this option to use the existing naming convention link without redefining the links.

IMPORTANT

- The tag number name structure is defined on the **Naming Conventions** dialog box in the Administration module. If you select to redefine the naming conventions, you must assign new values to the tag segments.

Validate tag and loop segments — Select this check box to verify the following:

- If the instrument type values of the imported tags in the **COMPONENT** table exist in the **Instrument Type** table (**COMPONENT_FUNCTION_TYPE**)
- If the loop function values of the imported loops in the **LOOP** table exist in the **Loop Function** table (**LOOP_FUNCTION**)
- If the measured variables of the imported loops in the **LOOP** table exist in the **Loop Process Variable** table (**LOOP_PROC**)

Clear this check box to skip the verification process.

IMPORTANT

- By default, this check box is selected, thus enabling the validation check of the imported tags and loops before transferring the data. It is recommended **not** to clear this box to avoid import failure due to missing data.

Use loop reference data — Select this check box if you want to create loop numbers and import loop number properties together with tag number import. If you clear this check box, the software does not create any loop numbers in SmartPlant Instrumentation.

IMPORTANT

- If the **COMPONENT** table contains empty loop reference fields, you must clear this box to prevent failure of the Import Utility.

Use tag data — Select this check box to include tag number data from the **Instrument Index** module supporting tables. This option is only available when importing data into the **Instrument Index** module. Remember, if you select this option, you have to define the naming conventions for all target <units> before you start the import process.

Source Tab (Link Properties Dialog Box)

The options on the **Source** tab enable you to define a filtering condition which will be used to import data **selectively** according to the filtering conditions you set that can contain any combination of the following:

- Source fields
- Operators or functions
- Alphanumeric values

The options in this tab also enable you to further define the import source by doing the following:

- Import data from more than one source table by associating the columns other tables or database files to the source table or database file. The associated columns then automatically become part of the source data which you select on the **Link Definitions** dialog box.
- Assign a process function to an instrument when importing from a database that has no such association.

Source table filter

Use filter — This option allows you to filter the source table and this way import selective data only.

Selecting this check box will make the data window accessible and the **Modify** button available.

Modify — Click to open the **Import Source Filter** dialog box where you can define a filtering condition to import selective data only.

Filter definition — Type the required filter condition in the window. You can also define the filter condition in the **Import Source Filter** dialog box. This filter condition will then appear in the data window.

Source tables

Associate — Select this check box to apply the defined source table associations that you defined in the **Associating Reference Tables** dialog box.

This check box is active only when importing data into modules that require code adapting, for example, the Process Data module.

Define — Click to open the **Associating Reference Tables** dialog box where you can associate additional source data to the source table that will be imported into one or more target tables.

Process function

Assign — Select this check box to apply the process function assignment you defined in the **Instrument Type Description** dialog box.

Define — Click to open the **Instrument Type Description** dialog box where you can assign a process function to an instrument which has no such association.

Use system codes — Select this check box to apply the system codes adapted from a source database that has system codes for its fields different from SmartPlant Instrumentation. This option is available only if the source table contains fields that require system codes. Note that prior to setting the import parameters, you have to select the appropriate source system in the **Source System List** dialog box and define the system codes in the **Adapt System Codes** dialog box.

Comparison Tab (Link Properties Dialog Box)

This tab is only available when defining properties for a link that you already used to import data. The options on the **Comparison** tab enable you to set import comparison options. During the import process, the Import Utility modifies the contents of the SmartPlant Instrumentation database by inserting, deleting, or updating the rows in the target tables. Therefore, it is advisable to coordinate these source and target rows before you start importing the data.

Import mode selection for comparison list

Use these options to select the required rows in the **Import Comparison List** automatically.

Apply — Applies the options in this group box that you have selected when generating the comparison list.

Inserted — Allows you to select all the inserted rows in the **Import Comparison List**.

Updated — Allows you to select all the updated rows in the **Import Comparison List**.

Deleted — Allows you to select all the deleted rows in the **Import Comparison List**.

Refreshed — Allows you to select all the refreshed rows in the **Import Comparison List**.

Automatically generate comparison list report — Allows you to automatically print out or display the print preview of the Comparison List Report right after you click the **Run** button on the **Import Comparison List** dialog box.

Import Level Tab (Link Properties Dialog Box)

The options on this tab allow you to import source tables defined per plant hierarchy item (for example, per <plant> or per <unit>) when your target domain contains more than one plant hierarchy item at a particular level.

As SmartPlant Instrumentation tables are defined per plant hierarchy item, these tables contain data unique on a specific level. For example, the **CABLE** table is defined per area; therefore, this table contains data unique only on the area level of the domain.

When importing from a domain containing more than one plant hierarchy item, some of the source rows may recur due to the existence of several plant hierarchy items. In this case, you can set your import link properties so that the Import Utility differentiates the rows of different plant hierarchy items, thus importing the data into the appropriate plant hierarchy items.

Hierarchy levels

You can also specify the plant hierarchy level when importing data into additional plant hierarchy item if your domain includes more than one <plant>, <area>, and <unit>.

Apply — Enables you to select a hierarchy level. If you do not select any hierarchy level, the Import Utility rejects all the recurring source rows, as it does not differentiate between the rows of different plant hierarchy items. The Import Utility also rejects all the recurring rows on the plant hierarchy levels that is lower than your selection if you import data on the highest plant hierarchy levels.

Data import level — Select the plant hierarchy level at which you want to import data, for example, plant, area, unit. All recurring rows on lower hierarchy levels will be rejected.

Import unit data using

- **Unit number** — Allows you to use the unit number data column as the key for importing data.
- **Unit name** — Allows you to use the unit name data column as the key for importing data.

Specify target projects in link — Allows you to import data into several project at a time if the current domain type is **Owner operator**. In the **Import Link** window, if your import method is **Single table**, when defining target table definition, you must provide the table definition for the **ENGINEER NAME/ENG PROJ ID** field in the **Target Name** column; if your import method is **Module (multiple tables)**, when defining target table definition, you must provide the table definition for the **Engineering Project Name** field in the **Target Name** column. Also, make sure you define the correct hierarchy levels for data import.

Specs Tab (Link Properties Dialog Box)

This tab is only available when the import link is defined for the **SPEC_SHEET_DATA** table or Specifications module. The options on the **Specs** tab allow you to set various options for importing specifications. You select the required SmartPlant Instrumentation specification form, set document number defaults, and define the link for multi-tag specification format if needed.

Specification item type (only available when the link is assigned to the **Single table** import method) — Allows you to specify the target item type.

Specification module

Specification form — Allows you to select the target specification form from the list.

Preview — Displays the preview of the selected specification form.

Specification sheet option

Use custom drawing name — Allows you to import spec document numbers from the source. You can then map the **Spec Drawing Name** field in the **Import Link** window (in the **Source Name** field of the **Target** data window). Document numbers in the import source must be unique for each instrument. If you clear this check box, the Import Utility creates specs with default document numbers.

Include revisions in import — Allows you to import spec revisions from the source. You can then map the **Spec Revision No** field in the **Import Link** window (in the **Source Name** field of the **Target** data window). If you clear this check box, you cannot import any specification revision data using the current import link.

Use custom drawing name for process data — Allows you to import source document numbers for process data sheets. You can then map the **Process Data Drawing Name** field in the **Import Link** window (in the **Source Name** field of the **Target** data window). Document numbers in the import source must be unique for each instrument. Even if the target spec form does not contain fields from process data tables and you do not import any process data value with the spec, the Import Utility creates an empty process data sheet in SmartPlant Instrumentation and associates it with the instrument for which you created the spec. If you clear this check box, if you import any process data value, when creating a spec, the Import Utility also creates a process data sheet and assigns a default document number to the process data sheet.

Multiple-item specification format

Import to multiple-item specification sheet — Select this check box to import all the SEE LIST data associated with the source tags. This option is available only if the specification form you selected is a multi-tag form. Selecting this check box makes the options in **Multi-item spec format** group box active.

Specification format — Select the required multi-tag format for the current link. You will not be able to change this definition when importing data to a module in the **Import Link** window. Note that this dialog box is only available if you have selected the **Multiple-item spec** check box.

Enable all formats for selection in link — Select this check box to select all the available multi-tag format for the current link. This will let you select the required multi-tag spec format in the **Import to Module** dialog box. Note that the format displayed in the list box will not affect the parameter settings if this check box is selected.

Custom Fields Tab (Link Properties Dialog Box)

The options on this tab allow you to define a link that will contain only Browser module custom fields as the target fields. These custom fields are those fields that used in the browser view style that you select on the **Custom Fields** tab. As a result, the **Import Link** window will display only the Browser module custom fields in its **Target** section.

The options on this tab are only available when the import link is defined for the Instrument Index module or Process Data – Line module.

NOTE Prior to setting these properties, you have to create the required custom browser view styles in the **Browser Manager** in SmartPlant Instrumentation.

Select style for custom name

Line — Select the required custom browser view style for the line from this list.

Use style for line — Select this check box to use the selected line style in the import process.

Equipment — Select the required custom browser view style for equipment from this list.

Use style for equipment — Select this check box to use the selected equipment style in the import process.

Loop — Select the required custom browser view style for the loop from this list.

Use style for loop — Select this check box to use the selected loop style in the import process.

Select dimensional group for custom name

From the list, select **Computed group name** to use the custom fields from the dimensional group associated with the tag number as a source of custom data. A dimensional group is associated with a tag number if the tag number has a profile that includes a dimensional group definition. Selecting **All Groups** allows you to type in the import link as the source the name of any dimensional group for which you want to use the custom fields.

Apply — Select this check box to enable the selection of an option from the list. The software clears this check box automatically when you select **All groups** from the list.

Style Tab (Link Properties Dialog Box)

The options on the **Style** tab allow you to control what fields are displayed in the **Import Link** window if you are defining a link where data will be inserted into reference tables. When creating a link using the **Single table** import method, and also include reference tables in the link, you can select an existing browser view that determines which fields are displayed in the **Import Link** window when you open the link. If there is no browser view that satisfies the needs of the current import session, create a browser view in the **Browse Manager** in SmartPlant Instrumentation.

When creating a link using the **Module (multiple tables)** method, only the **Display all fields** check box is available. You can select this check box to display all the fields of the target module tables and not just the fields contained in a special hard-coded list that limits the field list that appears in the **Import Link** window. This special list serves two purposes:

To shorten the field list displayed in the **Import Link** window.

- To display engineering field names instead of the names used in the database.

Display all fields — The check box selection functions according to the import method assigned to the link:

- When a link is assigned to the **Single table** import method, and also includes reference tables, the software disables browser view selection options. When you open the link in the **Import Link** window, the software displays all the fields that the target reference tables contain.
- When a link is assigned to the **Module (multiple tables)** method, and you selected any module apart from the Specifications module, the software adds the fields to the **Import Link** window that are not included in the special hard-coded list so that all target module table columns are displayed. In the **Import Link** window, the field names appear as they are in the database if they are not included in the special list. The fields that are included in the special list display meaningful engineering names.

Browser views

(Only available when using the Single table import method, provided that you also included reference tables in the link)

The data window displays all the existing browser views.

Style Preview — Displays the field list defined in the selected browser view. This opens the **Style Preview** dialog box where the fields selected the browser view are displayed in red. The **View** check box is selected next to the field names that will be displayed in the **Import Link** window.

Clear — Clears the browser view selection. In this case, the Import Utility does not use any browser view style but displays all the reference table columns in the **Import Link** window.

Select View — Applies the current style settings for the current link.

Multi-Form Tab (Link Properties Dialog Box)

This tab is only available when you assigned the import link to the **Module (multiple tables)** method and selected **Multiple Spec Forms** as the module name. The options on the **Multi-Form** tab allow you to select an existing multi-form browser for importing data to fields used in various spec forms according to the field headers that the browser contains. You must first define multi-form browsers in the Specifications module. For details, see *Define a Multi-Form Browser*.

Select multi-form browser

Displays all the existing multi-form browser names and allows you to select a specific browser as a target for importing data into spec form fields. When you open the link in the **Import Link** window, in the **Target** pane, the software displays the form field headers under **Target Name** and the form field names under **Column Name**. After you select a browser, the software saves your selection for the current link. When you reopen the **Multi-Form** tab, the browser assigned to the current link remains selected.

Browser — Displays the multi-browser field name as defined in the Specifications module.

Description — Displays the multi-form browser description as defined in the Specifications module.

Target Table Definition

Every table in SmartPlant Instrumentation has at least one definition that you can use when importing or comparing data. When you open a link in the Import Link window, all the displayed columns appear in the table definition that is set as the active definition. By default, every table has its own active definition called **Default**. You can set any other user-defined or shipped definition as the active definition instead of the **Default** definition. You manage table definitions using the **Target Table Definition** dialog box options. Your working area, where you create or modify key definitions, is the **Key definition** pane; a complete definition appears in the **Column definition** pane, where each column is indicated with a designated color. For details, see *Target Column Colors* (on page 46).

CAUTION

- Changing the settings in the **Target Table Definition** dialog box alters the relations between the tables. We therefore recommend you do not change these settings unless absolutely necessary and only if you are familiar with the SmartPlant Instrumentation database structure.

When importing data using the **Comparison List** options, table definitions allow you to control the way in which the Import Utility regards the source and the target rows as identical during the import process. This is important, because when the Import Utility encounters identical source and target rows, it can overwrite the target row or leave it intact, depending on the **Comparison** options which you select on the **Link Properties** dialog box. You can therefore control the import process result by selecting the appropriate import comparison criteria.

In SmartPlant Instrumentation, the database is organized in tables, for example, CABLE, COMPONENT, CONTROL_VALVE, and so forth. These tables contain data arranged in table columns, which represent properties of various items such as instruments, cables, panels, and so forth. For example, the COMPONENT table contains all the instrument tag data together with the appropriate links to other tables that contain instrument properties, such as COMPONENT_MFR (instrument manufacturer table), COMPONENT_MOD (instrument model table), and so forth.

Every SmartPlant Instrumentation table is defined at a specific plant hierarchy level. This means that the value of the primary key column of that table is unique at the specified level. For example, CMPNT_NAME is a primary key in the COMPONENT table. If you define the COMPONENT table at the <unit> level, the CMPNT_NAME value becomes unique at the <unit> level. This means that at the <unit> level, there cannot be more than one row with the same value in the CMPNT_NAME column. In the following example, the COMPONENT table primary key is CMPNT_ID, which holds database ID numbers of instrument tags. Each row in the COMPONENT table has a unique value at the <unit> level for the CPMNT_ID column.

Table: COMPONENT Definition: Default

Table List

- COMPONENT
- COMPONENT_MFR
- COMPONENT_MOD
- CONTROL_VALVE
- LINE
- PD_GENERAL
- SPEC_SHEET_DATA

☐ Domain
☐ Plant
☐ Area
☒ Unit

Column Definition

Column Name	Type	Reference Table	Visible	De
CMPNT_NAME	char		☒	☐
CMPNT MFR ID	char	COMPONENT MFR	☒	☒
CMPNT MOD ID	char	COMPONENT MOD	☒	☒
LOOP ID	char	LOOP	☒	☒
PROC FUNC ID	char	PROCESS FUNCTII	☒	☒
CMPNT FUNC TYPE	char	COMPONENT FUN	☒	☒

Key Definition

Key Name	Reference Table	Reference Column	Reference Key	Local
CMPNT_ID		CMPNT_NAME		☐

☒ Primary key
☐ Foreign key

☐ Define parameters for Level Key

The CABLE_MFR_MOD table key definition consists of the CABLE_MFR_ID and CABLE_MOD_ID keys. These keys ensure that the value of any particular cable model is unique. Both keys are required because different manufacturers may use the same model number, and therefore the manufacturer name must be included to specify model uniqueness, as shown in the following example.

Table: COMPONENT_MOD Definition: Default

Table List

- COMPONENT
- COMPONENT_MFR
- COMPONENT_MOD**
- CONTROL_VALVE
- LINE
- PD_GENERAL
- SPEC_SHEET_DATA

☒ Domain
 ☐ Plant
 ☐ Area
 ☐ Unit

Column Definition

Column Name	Type	Reference Table	Visible	Default
CMPNT MFR ID	char	COMPONENT MFR	☒	☒
CMPNT MOD NAME	char		☒	☒
PROC FUNC ID	char	PROCESS FUNCTII	☒	☒
CMPNT MOD DESC	char		☒	☒
CMPNT MOD ID	numbe		☐	☐
MOD COMPANY IDE	char		☒	☒

Key Definition

Key Name	Reference Table	Reference Column	Reference Key	Local
CMPNT_MFR_ID	COMPONENT_MFR	CMPNT_MFR_NAM		☐
CMPNT_MOD_ID		CMPNT_MOD_NAM		☐

☒ Primary key
 ☐ Foreign key
☐ Define parameters for Level Key

Every SmartPlant Instrumentation table has a key definition, which is used to specify a unique set of values. You can use one or more table columns in each table as constituents of the key definition.

Key name — Appears in every table and is used only by SmartPlant Instrumentation to access the corresponding table. The key name column is usually denoted by an **_ID** suffix. In most cases, the key name is designated as a primary key.

Reference table column — Appears in every table and is used by the user to access the table. For the COMPONENT table, the reference column is CMPNT_NAME. This means that each row in the COMPONENT table has a different value in the CPMNT_NAME column. You can select an appropriate reference table column for every table in the database. This way you can create a different comparison criteria for each table.

Foreign key — In some tables, the key name is designated as a foreign key, which is used as a reference column to link to another table called a reference table. For example, the CPMNT_MFR_ID foreign key in the COMPONENT table contains the COMPONENT_MFR table value in its key definition. This way, the CPMNT_MFR foreign key column links the COMPONENT table to the COMPONENT_MFR table. This allows SmartPlant Instrumentation to obtain the required instrument manufacturer data from the COMPONENT_MFR table. You can create a link to other tables by defining appropriate foreign keys. This way the Import Utility imports additional reference data during the import process, depending on the selection you make on the **Source** tab of the **Link Properties** dialog box.

Regular column — Appears in most tables and contains the appropriate table data such as display color, item price, remarks, specifications, and so forth.

NOTES

- Both the key name and the reference table column provide access to the SmartPlant Instrumentation database, but only the reference table column is accessible to you (the key name is for SmartPlant Instrumentation internal use only).
- When comparing rows, the Import Utility treats source and target rows as identical only if both the source and the target reference table column values are the same. For example, if the COMPONENT table in both source and target rows contains the same values in the reference table column data fields, both rows are considered as identical.
- When the Import Utility encounters identical source and target rows it can either replace the contents of the target row with the source row contents or leave this target row intact, depending on the import process settings.

Target Column Colors

Table columns appear in the **Column definition** pane in four possible colors:

- **Red** — Primary key (must be defined)
- **Blue** — Foreign key
- **Black** — Regular column in the target table
- **Magenta** — Reference table column which is defined as a regular table column (for example, not used to get linked data)

Key Numbering System

The software uses three numbering systems:

Global numbering system

When this system is used, the selected key number originates from a general number list that applies to the entire system.

Local numbering system

When this system is used, the selected key is numbered within a table. A primary key and a foreign key may contain more than one column. For example, the CABLE table primary key can contain both CABLE_ID and CABLE_NUM columns. Each key is numbered in the table. If a key contains more than one column, each column is numbered in the key. If CABLE_ID and CABLE_NUM are the columns comprising the CABLE table primary key, then each column has a serial number within the CABLE table primary key, for example, 1 and 2. The PANEL_STRIP table primary key also consists of two columns:

- PANEL_NAME, which originates from the PANEL table and is numbered globally
- STRIP_NAME, which is numbered locally

Therefore, in every new panel, the terminal strip numbering restarts from 1, whereas the panel numbering continues the global numbering.

Local revision numbering system

This is a local numbering method which starts from zero instead of from one.

Reference Key Definition

In the **Key definition** working area, selecting a value for the **Reference Key** table column is not required if the current key is a not a foreign key. When the current key is a foreign key, the following two situations are possible:

- The value in the **Reference Key** data column is the same as the one specified under **Key Name**; in this case the **Reference Key** data column is left empty, as in the following example:
If using the CABLE_MOD_ID from the CABLE table in the key definition, the key name CABLE_ID is identical to the reference key.
- The value in the **Reference Key** data column is different from the one specified under **Key Name**; in this case the appropriate value appears under the **Reference Key** data column, and the column title **Reference Key** is displayed in bold text, as in the following example:
If using the CONNECTOR_SIDE1_ID from the CABLE table in the key definition, the key name CABLE_ID is different from the reference key, the value of which in this case is CONNECTOR_ID.

Changing the Target Column Type

You can change the target table column type, for example, from **char** to **number** and vice versa. This is required if the source table column and the target table column are of different types; for example, one table column is defined as **char** and the other is defined as **number**. In this case, you can change the column type of the target table into **char** by defining it as a foreign key or change the table column type into **number** by deleting this column key definition. See *Delete Key Definitions of a Specific Table* (on page 52) to learn how to delete the column key definition.

Key Levels

The key level operation is designated for tables that contain terminal strip data, such as PANEL_STRIP, STRIP_CONFIG, STRIP_MFR, and so forth. You can specify what fields the Import Utility creates during the import process prior to generating a selected target column. You do this by activating the key level option and specifying the required target field to create prior to generating the selected target field.

Example

The STRIP_MFR_MOD table primary key contains two columns: STRIP_MFR_ID and STRIP_MOD_NAME.

To generate the STRIP_MOD_NAME column, the Import Utility will create the STRIP_MFR_ID and the STRIP_MOD_ID columns prior to generating the STRIP_MOD_NAME column.

If you select **Define parameters for key levels**, in the **Column definition** pane, the Import Utility automatically creates the fields which you specify under **Key Level** prior to generating the corresponding table column under **Column Name**.

Table Definitions Common Tasks

The following tasks are used when you need to modify a table column definition specified for a particular table.

Create a Table Definition on the Basis of Another Definition

Use this procedure to create a new table definition on the basis of an existing definition. For more information, see *Create a Table Definition on the Basis of Another Definition* (on page 48).

Set a Definition as the Active Definition

Use this procedure to set an existing table definition as the active definition for that table. In the **Import Link** window, the software only displays table columns that exist in the table definition set as the active definition. By default, every table has its own active definition called **Default**. For more information, see *Set a Definition as the Active Definition* (on page 49).

Modify a Table Definition

Use this procedure to modify the table column definitions in the target database.

CAUTION The software does not validate whether your table definition is correct. Importing wiring data using incorrect table definitions or altering default definitions might result in severe data integrity problems in SmartPlant Instrumentation.

For more information, see *Modify a Table Definition* (on page 49).

Rename a Table Definition

Use this procedure to rename an existing table definition. For more information, see *Rename a Table Definition* (on page 51).

Delete Key Definitions of a Specific Table

Use this procedure to delete column key definitions for a given table. For more information, see *Delete Key Definitions of a Specific Table* (see "Delete a Table Definition" on page 52).

Delete a Table Definition

Use this procedure to delete a table definition. For more information, see *Delete a Table Definition* (see "Delete Key Definitions of a Specific Table" on page 52).

Create a Table Definition on the Basis of Another Definition

1. On the **Target Table Definition** dialog box, for the target table, click **Definition**.
2. On the **Table Definition Name** dialog box, select a definition that you want to use as a source for creating a new definition.
3. Click **OK**.
4. When prompted to view the definition, click **Yes**.
5. Make the changes that you require. For details, see *Modify a Table Definition* (on page 49).
6. Click **Clear** to clear the **Key definition** working area.
7. Click **Save As**.
8. On the **Definition Names** dialog box, do the following:
9. Click **Insert**.
10. Click the new row and type a unique name.

11. Click **OK**.
12. On the **Target Table Definition** dialog box, click **Close**.
13. If prompted to set the new definition as the active definition, do one of the following:
 - Click **Yes** to and set this definition as the definition that is used in the **Import Link** window.
 - Click **No** to leave the new definition in the list of the definitions assigned to the current import link.

TIP The software prompts you to set the new definition as the active definition instead of the existing one if you opened the **Table Definitions** dialog box from the **Link Properties** dialog box.

Set a Definition as the Active Definition

1. On the **Target Table Definition** dialog box, for the target table, click **Definition**.
2. On the **Table Definition Name** dialog box, select a definition that you want to set as active and use in the Import Link window instead of the current active definition.
3. Click **OK**.
4. When prompted to view the definition, click **No**.
5. When prompted to set the selected definition as the active definition instead of the existing one, click **Yes**.

Modify a Table Definition

1. Do one of the following:
 - On the menu bar, click **Service > Target Table Definition**.
 - On the **Link Properties** dialog box, click **Table Definition**.
2. On the **Target Table Definition** dialog box, under **Table List**, select the table whose column definitions you want to modify.

NOTES

- The automatically selected option button beneath the **Table List** pane indicates the plant hierarchy level of the table in the target domain.
- If you open the **Table Definition** dialog box from the **Link Properties** dialog box, you can only modify the definition for the source tables to which the import link is assigned.

3. Click **Definition**.
4. On the **Definition Names** dialog box, do one of the following:
 - In the **Description** data window, select an existing definition.
 - Click **Insert** to add a new definition in the **Description** data window and then click **Edit** to type the new definition name.

NOTES

- For each table there is one shipped definition called **Default**. You can use the **Default** definition as a basis for creating new definitions. We recommend that you do not modify the **Default** definition itself.

- For certain tables, apart from the **Default** definition, there is a number of other shipped definitions. You must select a definition that is appropriate for the type of association of the items that you are going to import. For example, when importing terminal strips, several definitions exist for the PANEL_STRIP table because you might have some panels with direct connections to strips, and other panels that include items above the strip, such as a panel-rack-wiring equipment-strip association. In this case, you need to create several import links, each with an appropriate definition for the desired association.
5. Click **OK** to return to the **Table Definition** dialog box.
 6. In the **Column Definition** section, do the following:
 - a. Select **Visible** for each column you want to display in the **Import Link** window.
 - b. Select **Default** for each column to import the default value (space, zero or asterisk) whenever the column value is not defined.

CAUTION For some columns, for example, primary keys, the Import Utility automatically clears the **Visible** check box. To avoid import failure, we recommend that you do not make these table columns visible.
 7. To set the type of the table column selected under **Key Definition**, do one of the following:
 - Accept the displayed key definition.
 - Select **Primary key** to use this column as a primary key.
 - Select **Foreign key** to use this column as a foreign key.

NOTE Selecting **Foreign key** opens the **Foreign Key List** pop-up window. If you do not intend to modify the foreign key definition, close the **Foreign Key List** pop-up window.
 8. If you need to modify the definition of a foreign key, from the **Foreign Key List** pop-up window, drag the appropriate foreign key to the **Key definition** working area .
 9. To link the selected table column to a reference table, do the following:
 - a. From the **Reference Table** list, select the appropriate reference table.
 - b. From the **Reference Column** list, select the appropriate primary key.

NOTES

 - If the current key is a foreign key, the value under **Reference Column** is a column name in the reference table specified under **Reference Table**.
 - If the current key is not a foreign key, the value under **Reference Column** is a column name in the current table.
 10. From the **Reference Key** list, do one of the following:
 - Accept the given default values (recommended).
 - Select the appropriate reference key if required.
 11. To determine the way the current key will be numbered in the target database (note that this is an internal value which is not accessible to you), do one of the following:
 - Select the **Local** check box to follow the previous- level numbering to make the currently defined table column address unique in the target database.
 - Clear the **Local** check box to follow the global numbering in SmartPlant Instrumentation.
 12. To modify the definition of the additional column of the current table, do the following:
 - a. Drag the appropriate table columns from the **Column definition** pane to the **Key definition** working area.
 - b. If needed, select **Define parameters for Level Key** to specify the columns for automatic creating during the import process. This way, in the **Column definition** pane, the Import Utility creates the table columns specified under **Level Key** before creating the corresponding table columns under **Column Name**.

- c. In the **Column definition** pane, click  to display the **Level Key** fields.
- d. Under **Level Key**, do one of the following:
 - Type the names of the table columns to be created by the Import Utility during the import process before it creates the corresponding table columns under **Column Name**.
 - Clear **Define parameters for Level Key** to discard the table columns specified under **Level Key**.
13. Click **Apply**.
14. When prompted, click **Yes** to confirm the changes and clear the **Key definition** working area.
15. Click **Save** to save your selection of table keys.
16. Click **Close** to close the **Table Definition** dialog box.

See Also

Import Wiring Connection Data (on page 111)

Rename a Table Definition

1. On the **Target Table Definition** dialog box, for the target table, click **Definition**.
2. On the **Table Definition Name** dialog box, select a definition that you want to rename.

NOTE You cannot rename the **Default** definition.
3. Click **OK**.
4. When prompted to view the definition, click **Yes**.
5. Make the changes that you require. For details, see *Modify a Table Definition* (on page 49).
6. Click **Clear** to clear the **Key definition** working area.
7. Click **Save As**.
8. On the **Definition Names** dialog box, click the definition name and then type a unique name instead of the existing one.
9. Click **OK** to close the **Definition Names** dialog box.
10. On the **Target Table Definition** dialog box, click **Close**.
11. If prompted to set the renamed definition as the active definition, do one of the following:
 - Click **Yes** to and set this definition as the definition that is used in the **Import Link** window.
 - Click **No** to leave the renamed definition in the list of the definitions assigned to the current import link.

TIP The software prompts you to set another definition as the active definition instead of the existing one if you opened the **Table Definitions** dialog box from the **Link Properties** dialog box.

Delete Key Definitions of a Specific Table

1. On the **Target Table Definition** dialog box, under **Table list**, select the table whose key definitions you want to delete.
2. Click **Definition**.
3. In the **Definition Names** dialog box, under **Description**, select the definition.
4. Click **OK** to display the columns of the selected table in the **Table list** pane.

TIP The appropriate table columns appear in the **Column definition** pane. The comparison definition also appears in the **Key definition** working area.
5. Click **Delete Key** to delete all the key definitions of the selected table.
6. When prompted, click **Yes** to confirm the deletion and clear the **Key definition** working area.
7. Click **Save**.
8. Click **Close**.

Delete a Table Definition

1. On the **Target Table Definition** dialog box, under **Table list**, select the table whose definition you want to delete.
2. Click **Definition**.
3. On the **Definition Names** dialog box, select the definition you want to delete.
4. Click **Delete**.

TIP You can select and delete one definition at a time.
5. When prompted, click **Yes** to confirm the deletion.
6. Click **OK**.
7. On the **Target Table Definition** dialog box, click **Save**.
8. Click **Close**.

Working with Log Files

A log file allows you to keep track of all your import operations. Log files carry all the information about your import activities. When you first start the Import Utility, you will create your first log file. It will keep growing as you continue importing data unless you decide to change the current log file. The information in the log file is organized in an ascending chronological order. This information includes:

- The domain details.
- The source and target details (the source table/file name; the target table/module name).
- Rejected data rows details (if there are any).
- The import results (the number of total rows, inserted, updated, and rejected rows).

NOTE You can perform the import process without a log file but it is not advisable, as you will not have a record of the import execution. If you start the Import Utility with no log file defined, you will get a message after you select the target <unit> in the **Open** dialog box.

You can create a new log file, open an existing log file, delete a log file, view a log file, check the name of the current log file, or close the current log file.

Working with Log Files Common Tasks

The following tasks are used when you work with log files.

Create a New Log File

This procedure shows you how to create a log file. It is advisable to create a new log file each time you perform an important import operation. You should also create a new log file if your existing log file has become too long.

For more information, see *Create a New Log File* (on page 54).

Open an Existing Log File

This procedure shows you how to open an existing log file. It is advisable to open a log file before you perform an import procedure so that you have a record of the import process.

For more information, see *Open an Existing Log File* (on page 54).

View the Current Log File

You can view the current log file to review the previous import process information. You can also view any other existing log file.

For more information, see *View the Current Log File* (on page 54).

Check the Name of the Current Log File

This procedure shows you how to check the name of current log in use.

For more information, see *Check the Name of the Current Log File* (on page 54).

Close the Current Log File

You can also import data without a log file. If you choose to do this and there is a current log file, you can close it.

For more information, see *Close the Current Log File* (on page 55).

Delete an Existing Log File

You can delete a log file when the information in it becomes unimportant.

CAUTION This action deletes the selected log file from your hard disk.

For more information, see *Delete an Existing Log File* (on page 55).

Log the Import Parameters

This procedure shows you how to log the import parameters which you use in the current import process.

For more information, see *Log the Import Parameters* (on page 55).

Create a New Log File

1. Click **Log File > New**.
2. In the **New Log File** dialog box, type the name of your new log file, select the required path and click **OK**.

NOTE The Import Utility opens a new (empty) log file automatically, even though you do not see it.

Open an Existing Log File

1. Click **Log > Open**.
2. In the **Open Log File** dialog box, select the name of the log file you want to open and click **OK**.

NOTE After you create a new log file or open an existing one, it stays open even though you do not see it displayed. The log file remains active until you close the Import Utility. When you exit the Import Utility, the log file closes automatically and reopens when you restart the Import Utility. See *Close the Current Log File* (on page 55) to learn how to close the current log file manually.

View the Current Log File

- Do one of the following:
 - Click .
 - Click **Log > View**.

NOTE The current log file is opened for viewing by Notepad. SmartPlant Instrumentation uses Notepad to view the log file. However, Notepad is limited by file size that it can handle. If your log file becomes too large for Notepad, you will get an appropriate message. In this case you can view your log file using Windows Write or another appropriate utility.

Check the Name of the Current Log File

On the **Log File** menu, click **Log File Name**.

TIP The Import Utility shows you a message where it states the path and filename of your current log file..

Close the Current Log File

On the **Log File** menu, click **Close**.

NOTE The Import Utility immediately closes the current log file. After you close the current log file you need to define a new log file to resume tracking the import process. For details, see *Create a New Log File* (on page 54).

Delete an Existing Log File

1. Click **Log File > Delete**.
2. In the **Open Log File Name** dialog box, select the name of the log file you want to delete and click **OK**.

Log the Import Parameters

Click **Log > Show Link Parameters**.

NOTES

- The **Show Link Parameters** command remains checked on the **Log File** menu. Click the command again if you need to clear this option.
- After you run the import process, a section named **Link Parameters** is added in the current log file, where you see the import parameters used in this import process.

Viewing the Source Data

It is possible to view the contents of the source table or database file specified for a particular import link. You can view source data from any of the following locations in the Import Utility:

- **Link Definitions** dialog box, after selecting the source data
- **Import Source Filter** dialog box
- **Import Link** window

Working with Source Data

The following tasks are used when you working with the source table or database file.

View the Source Data

Use this procedure to view the contents of the source table or database file that you selected when entering the Import Utility. For more information, see *View the Source Data* (on page 56).

Select the Desired Viewing Option

Use this procedure to select viewing options for your data source. The following viewing options are available:

- Viewing all source data fields.
- Viewing only linked source data fields.
- Viewing only selected source data fields.

For more information, see *Select the Desired Viewing Option* (on page 56).

Filter the Displayed Source Data Fields

Use this procedure to filter the source data displayed in the **Source Data** section according to the filtering condition you defined on the **Source** tab of the **Link Properties** dialog box. To use this option, you must define a filtering condition. For more information, see *Filter the Displayed Source Data Fields* (on page 57).

Sort the Displayed Source Data Fields

Use this procedure to perform an alphanumeric ascending sorting of the information displayed in the **Source Data** window according to one or more selected data fields. For more information, see *Sort the Displayed Source Data Fields* (on page 57).

Associate Additional Source Data

Use this procedure to import additional data and associate it to the source table that you selected on the **Link Definitions** dialog box. This way you can import data into your database from more than one source table. You do this by associating columns from other tables or database files with the source table or database file. The associated columns automatically become a part of the source data which you have selected on the **Link Definitions** dialog box.

NOTE You can use associations which have been previously saved in a link. To do this you have to start the import process using a previously saved link.

For more information, see *Associate Additional Source Data* (on page 57).

View the Source Data

Do one of the following to display the **Source Data** window:

- In the **Import Link** window, click .
- On the **Link Definitions** or **Import Source Filter** dialog box, click **View Source**.

Select the Desired Viewing Option

1. With the **Source Data** window open, do one of the following:
 - To view all the source data fields, click **Show > All**.
 - To view only the fields of the displayed source data which are linked to other tables or to the database, click **Show > Linked fields**.

TIP You can view linked data fields only if you have already defined the links between the source and the target data fields in the **Import Link** window or if you have already used the definitions of a previously saved link.
2. To view selected source data fields, do the following:
 - a. Click **Show > Select Fields**.
 - b. On the **Display Source Columns** dialog box, drag the data fields you want to view from the **Source Columns** pane to the **Selected Columns** pane.
3. Click **OK**.

Filter the Displayed Source Data Fields

- With the **Source Data** window open, do one of the following:
 - On the **Filter** menu, click **On** to filter the displayed source data according to the filtering condition you previously defined.
 - On the **Filter** menu, click **Off** to display the source data without filtering it.

Sort the Displayed Source Data Fields

1. With the **Source Data** window open, click **Sort > Custom Set**.
2. In the **Display Source Fields** dialog box, drag the data fields by which you want to sort the displayed source data from **Source Fields** to **Selected Fields**.
3. Click **OK**.

NOTE Sorting the source data in this dialog box does not affect the import results.

Associate Additional Source Data

1. Select the desired link and click .
 2. In the **Link Properties** dialog box, click the **Source** tab.
 3. Under **Source tables**, click **Define**.
 4. In the **Associate Source Data** dialog box, click **Add** to add a data set (for example, a table or a database file) to the **Source list** data window.
 5. Repeat the previous step to add as many data sets as required.
- TIP** It is possible to use the same table more than once as a source.
6. Highlight the desired data set to associate to and under the **Association** group box, click **Select**. The selected data set is copied to the **Source for association** data window.
 7. Expand the data sets as desired in each data window by double-clicking them, then drag the required item in that data set to the appropriate data set item in the **Source for association** data window.

The association between the two data items is indicated by the appearance of an icon () to the right of each data item in the appropriate section.

CAUTION In SmartPlant Instrumentation, table columns contain numbers (**num** type columns) and characters (**char** type column). You cannot associate a **num** type column with a **char** type column or the other way around.

8. Repeat the previous step to associate other data items as desired.

TIP

- You can associate several items with a single data set item, however, you cannot associate data from a data set with itself.
- To delete an association, select the desired item in the **Source for association** data window and press **Delete** on the keyboard.

9. Click **Verify** to make sure your selections are valid (this way you can check, for example, whether the associated table columns are both of the same data type - numeric or alphanumeric).

An appropriate message is displayed: if the associations are valid, the total number of rows of the source data set (including the associated data) is indicated, or else you are notified that

the associations are invalid, in which case you should correct your selection in the **Source Associations** dialog box.

10. Click **Confirm**.
11. When prompted, click **Yes** to save your associations.
The data sets disappear from the right data window and appear at the top of the left data window.
12. To make the fields of the associated data appear in future dialog boxes, do the following:
 - a. Expand the associated data sets by double-clicking them.
 - b. Click **once** on every item you want to view.

The icons appear as follows:

Item selected: 

Item not selected: 

TIP You can view the contents of an associated data item in the **Import Link** window. To be able to view the associated data, click  when available, after you select the required table. For further details, see *Viewing the Source Data* (on page 55).

CAUTION Make sure you remove all disassociated tables from the data windows in the **Source Associations** dialog box before you click **Save**.

13. Click **Save** to save your association.
14. In the **Link Properties** dialog box, under **Source Associations**, do one of the following:
 - Select **Apply** to use your associations in the current import process.
 - Clear **Apply** to skip the defined associations.

Built-In Operators and Functions

Operator / Function	Description	Example
=	Equal to	cpmnt_mfr = 'Shell'
>	Greater than	cpmnt_num > 101
<	Less than	item_price < 100
>=	Greater or equal to	cpmnt_num >= 10

Operator / Function	Description	Example
=<	Less than or equal to	item_price =< 30
<>	Not equal to	suffix <> 'AA'
AND	Include the following expression in the filter combination	(name <> '') AND (num <> 0)
OR	Accept either the previous or the following expression in the filter combination	(loop = '') OR (line = '')
NOT	Select the value opposite to the following expression	NOT (item_price = 0)
LIKE[value]	Select a similar value that is similar to the one in the [value] field. You can use the following wildcard characters: % – any combination of characters. _ – any single character.	cmpnt_num LIKE '%AA%'
IN	Select a value that is equal to one of those specified in the parentheses	cpmnt_num = IN (101,103)
BETWEEN	Select a value which is within the following interval	item_price BETWEEN 100 AND 500
IS NULL	Contains an undefined value	loop_name IS NULL
IS NOT NULL	Not equal to NULL	cpmnt_name IS NOT NULL

SQL Functions Native to the Source Database

The **SQL Functions** select list enables the use of special functions which are native to the source database. The following functions are the most common ones:

SQL Function and Source Databases	Description	Syntax and Output Example
LTRIM (<value>) dBase Sybase Adaptive Server Anywhere 10.0, Oracle, SQL Server	Removes all leading spaces in the field indicated in the parentheses.	LTRIM(cmpnt_mfr) cmpnt_mfr = 'Shell' LTRIM(cmpnt_mfr)='Shell'
RTRIM(<value>) dBase Sybase Adaptive Server Anywhere 10.0, Oracle, SQL Server	Removes all trailing spaces in the field indicated in the parentheses.	RTRIM(cmpnt_num) IS NULL cmpnt_num = '108-FT 100' RTRIM(cmpnt_num)='108-FT 100'
SUBSTRING(<value>,<begin>,<count>) dBase Sybase Adaptive Server Anywhere 10.0, Oracle	Retrieves a part of the field indicated in the <value> data field from the <begin> position for the number of characters indicated in the <count> field.	SUBSTRING(cmpnt_mfr,1,4) cmpnt_mfr = 'Shell' SUBSTRING(cmpnt_mfr,1,4)='Shel'
SUBSTR(<value>,<begin>,<count>) SQL Server	Retrieves a part of the field indicated in the <value> data field from the <begin> position for the number of characters indicated in the <count> field.	SUBSTR (cmpnt_mfr,1,4) cmpnt_mfr = 'Shell' SUBSTR(cmpnt_mfr,1,4)='Shel'
UCASE(<value>) dBase Sybase Adaptive Server Anywhere 10.0	The upper case format of the contents of the field indicated in the <value> data field.	UCASE(cmpnt_name) cmpnt_name = '101-aa' UCASE(cmpnt_name)='101-AA'
UPPER(<value>) Sybase Adaptive Server Anywhere 10.0, Oracle, SQL Server	The upper case format of the contents of the field indicated in the <value> data field.	UPPER(cmpnt_name) cmpnt_name = '101-aa' UPPER(cmpnt_name)='101-AA'
LCASE(<value>) dBase Sybase Adaptive Server Anywhere 10.0	The lower case format of the contents of the field indicated in the <value> data field.	LCASE(loop_name) loop_name = '101- AA' LCASE(loop_name)='101-aa'
LOWER(<value>) Oracle, SQL Server	The lower case format of the contents of the field indicated in the <value> data field.	LOWER(loop_name) loop_name = '101- AA' LOWER(loop_name)='101-aa'

Mapping Import Links (Primary Keys and Primary Values)

Each SmartPlant Instrumentation table contains a primary key data field, which, like the primary key table column, is used as a prime key for accessing the table data. The difference between the primary key table column and the primary key data field is that you can only access the latter, whereas the primary key table column is an internal database key used by SmartPlant Instrumentation only.

Example:

The COMPONENT table contains a primary key table column, CMPNT_ID, which is an internal SmartPlant Instrumentation database key, and a primary key CMPNT_NAME, which contains the tag number.

If you import data using the Single table method you can:

- Allow the Import Utility to generate the primary key data field automatically according to the naming conventions that you will enter; to do this you will need to manually define appropriate naming conventions for both the tag and the loop. This way, the primary key data field will contain the value **Computed** which means that its contents have been predetermined by the Import Utility, based on the naming conventions you entered.
- Use the naming conventions in the link; this way you will need to manually create the primary key data field contents and naming conventions by specifying the appropriate parts (for example, PREFIX, SUFFIX). This way, you define the value of all the target data fields that you require either by typing in the appropriate value in the target data field, or by selecting the appropriate source table column and linking it to the desired target data field.

NOTE If you select to import data using the Single table method you must define the links of all primary key data fields. If you have selected to import data using the Module (multiple tables) method, you do not need to define the links to all the primary key data fields, because it is possible to limit the import of data only into certain target tables.

At this stage you can also::

- Make a more precise selection by selecting the required source and target rows which will be processed during the import process.
- Select the reference tables you want to import.
- Save the current link to be used in future import sessions.
- View the source rows.
- Perform a test run to evaluate the import process results.
- Carry out the import process.

After you map all the desired source and target data you can make a more precise selection. You do this by selecting the source and target rows to be inserted updated or deleted during the import process.

When you finish defining the mapping between the target and the source, you will come to the end of the import setup process at which point you will be able to carry out the actual import of data.

Map Source and Target Fields Common Tasks

The following tasks are used when you map the fields in your data source with target table columns in SmartPlant Instrumentation.

Define Links for Naming Conventions

In this procedure you define the source naming conventions of the tag name and the loop name. You have to go through this stage in one of the following situations:

- You have selected the **Redefine the naming conventions** check box in the **Tag/Loop** tab on the **Link Properties** dialog box.
- You have started a **new** import session but you did not clear **Define the naming conventions in the link** check box in the **Tag/Loop** tab on the **Link Properties** dialog box.

You define the links for the naming conventions on the **Define Tag Name Structure** dialog box and/or on the **Define Loop Name Structure** dialog box depending on whether the target contains component names, loop names or both. You have to complete the definitions in one or both dialog boxes depending on whether the target table or tables contain one or both naming conventions.

The current naming conventions are those that the Domain Administrator previously defined in the Administration module. For more information, see *Define Links for Naming Conventions* (on page 63).

Open Import Links

This procedure shows you how, after selecting the required import links in the **Link Explorer**, you can open the links to view or modify the mapping before importing data. For more information, see *Open Import Links* (on page 64).

Define the Import Mapping

This procedure shows you how, after creating the import links and defining the required properties, to map the source and target data. Depending on the import method (Single table or Module), you define the link mapping in the appropriate **Import Link** window. The table columns that you need to map depend on the target data type. For more information, see *Define the Import Mapping* (on page 64).

Configure Source Data for Variable Length Data Fields

Where a source data field is likely to vary in length and it is only a sub-string of another field, you should ensure that your source data is configured correctly. For more information, see *Configure Source Data for Variable Length Data Fields* (on page 65).

Define Links for Naming Conventions

NOTE In this procedure, the **Define Tag Name Structure** dialog box is used as an example.

1. If required, do the following to instruct the Import Utility to put leading zeros in front of the numeric part of the loop / tag name (for example, to have the tag **108-FT 0001** instead of **108-FT 1**) for the loops or tags in all the available import links:
 - a. Click **File > Preferences**.
 - b. In the **Import Preferences** dialog box, click the **Tag/Loop** tab.
 - c. Select **Insert leading zeros for numeric values** and click **OK**.
2. In the **Link Explorer**, select the desired links that include loop or tag data.
3. Click  to open the **Link Properties** dialog box and click the **Tag/Loop** tab.
4. Do the following:
 - a. Clear **Define the naming conventions in the link**.
 - b. If required, select **Redefine the naming conventions**.
 - c. If required, select **Replace null string with space** to instruct the Import Utility to translate any null strings in your source data into spaces.
 - d. Click **OK**.
- TIP** It is advisable to select the **Replace null string with space** check box if you are not sure if any source table columns are null or not.
5. Do one of the following:
 - Click  to open the links.
 - Click  to import data using the links.
6. In the **Define Tag Name Structure** dialog box, select the name of the source table from the **Source Table Column List** data window.

TIP You can search for a source name in the **Source Table Column List** by pressing the key corresponding to the first letter of the source name. Make sure you select one of the rows in the **Source Table Column List** data window first.
7. Drag the selected source name to the **Name Convention** window (the target) and drop it in the appropriate **Source Name** row.

TIP You should ensure that your source data configured correctly if the loop or tag names are likely to be of variable length. For details, see *Configure Source Data for Variable Length Data Fields* (on page 65).
8. In the **Start** column of the **Name Convention** data window, enter the starting location of the string within the naming convention.

TIP If you click **Cancel** in the **Define Tag Name Structure** dialog box or in the **Define Loop Name Structure** dialog box without completing the tag or loop definition, an appropriate message will be displayed, after which you will return to the **Link Explorer**.
9. Select **Enable any source name for prefix** to allow you to enter any value for the prefix or clear the check box to restrict the prefix to a fixed value based on the current plant hierarchy item.

TIP If you are importing data for both loops and tag numbers, you must select or clear this option for both the loop and tag name structures.
10. Click **View Source** to view the source table. For further details, see *Viewing the Source Data* (on page 55).
11. Click **OK** to proceed with the import setup process.

Open Import Links

1. In the **Link Explorer**, select the required groups or links in the **Link list**.
2. Do one of the following:
 - Click **Actions > Open Link**.
 - Click  (**Open Link**).
3. In the **Import Link** window, make changes to the link mapping as required. For details, see *Using the Link Explorer Window* (on page 21).

See Also

Viewing the Source Data (on page 55)

Tag Class Mapping Codes for Instrument Index Import (on page 68)

Define the Import Mapping

1. In **Import Link** window, in the **Target** pane, review the status of the target data fields. The status is indicated by the following colors:
 - **Red** — Indicates a primary key column (must be defined in the link).
 - **Blue** — Indicates a foreign key column.
 - **Black** — Indicates a regular column in the specific target table.
 - **Magenta** — A column defined as **NOT NULL** and which is defined in the **Table Definition** dialog box as **NOT DEFAULT**.

IMPORTANT When importing data using the Module method, you do not need to define the **Primary Key** links. However, if you want to import any part of a table, its supporting table, or its reference tables, you **must** define that table's **Primary Key** links.

2. In the **Target** pane, under **Source Name**, do one of the following:
 - Click the desired row under **Source Name**, and then select one or more table columns in turn from the **Source** pane.
 - Type known source table column values.
 - Enter a fixed string (for example, a formula) instead of linking source data. The fixed string must be enclosed in single quotes ('...').
 - Drag one or more selected table columns from the **Source** pane to the desired row under **Source Name** in the **Target** pane.

TIPS

- Whenever you drag a new source table column to a field under **Source Name**, a **+** sign is automatically added before the new field, for example:
CMPNT_NAME+FUNC_DESC+FUNC_TYPE
 - When defining import mapping for **COMPONENT** table columns, you must specify a correct value for the **CMPNT CAT ID (Tag Class)** column. For details, see *Tag Class Mapping Codes for Instrument Index Import* (on page 68).
3. If needed, in the **Source Name** fields, use formulas and arithmetic functions. For details, see *Formulas and Arithmetic Functions in Import Links* (on page 66).

TIP If the total length of the **Source Name** data field is longer than the target field length (in the **Length** data field of the **Target** pane), a scissors symbol (✂) appears to the left of the **Source Name** data field.
 4. In the **Source Name** column, modify the data fields as you require, using various string operators. For details, see *String Operators in Import Links* (on page 66).

TIP If you need to define import mapping for a process function (**PROC_FUNC_NAME** column), note that you can set the software to use the **@PROC_FUNC_NAME** macro, so that you do not need to define manual mapping for process function and instrument type fields. The software uses this macro if you have assigned process functions to instrument type fields using the **Source** tab options of **Link Properties** dialog box. For details, see *Set Source Fields as Instrument Type Fields* (on page 91). This macro appears in the **Import Link** window whenever the **PROC_FUNC_NAME** column exists in the target table.

5. After defining all desired settings in the **Import Link** window, do one of the following:

- Click  to start an import test run which helps you evaluate the import results without saving data to the target table or tables. For details, see *Test the Import Process* (on page 82).
- Click  to start the import process.
- Click  to save the current link settings in the Import Utility. You can use the saved link in other import sessions.

See Also

String Operators in Import Links (on page 66)

Example of Concatenated Sources (on page 95)

Configure Source Data for Variable Length Data Fields

Where a source data field is likely to vary in length and it is only a sub-string of another field, you should create a separate data field in the source for each of the sub-strings (PREFIX, MEASURED VARIABLE, FUNCTION TYPE, and so forth).

For example, the source table may contain the following tags (the instrument type is indicated in **bold** type):

108 **FT**100
 108 **ICP**100
 108 **FT**100
 108 **ILP**100

In this case the data field in **bold** type varies in length according to the particular tag. Therefore, you need to create a separate data field for each of the parts of the instrument type, for example:

108 **FT** 100
 108 **ICP** 100
 108 **FT** 100
 108 **ILP** 100

If you have defined a fixed-name string as a prefix, you do not have to link source data to this part of the naming convention. The Import Utility will create this part automatically during the import process.

String Operators in Import Links

When defining the import mapping, you can use various string operators in the **Source Name** field of the **Import Link** window. The following string operators are available:

Operator	Description	Example
'...'	Single quotes. You must enclose any fixed string in single quotes if you do not want to link the source data directly.	'101-FT-100' — Imports a specific tag number.
(n,n)	Sub-string operator. This operator allows you to transfer a sub-string of a source field value by adding in parentheses the string parameters: the starting character and the string length.	cab_name(3,2) — Indicates that you want to transfer two characters from the cab_name field, starting from the third character.
&	Ampersand character. This character allows you to trim any leading or trailing spaces in the imported value. You must add the & character before the field value in the link.	&tag_name(5,5) — In this example, the source field (tag_name) is a string representing an entire tag name such as 101-FT -100 (where the instrument type segment can be up to 5 characters long and includes trailing spaces). This example includes a sub-string of 5 characters in length starting from the 5th character, which in this case is 'FT ' (with 3 trailing spaces). The '&' character preceding the string ensures that these trailing spaces are trimmed, so that the imported string will actually be 'FT'.
#	Pound character. The # character, preceded and followed by a + character (...+#+...) indicates the end of the current line so that the imported value following #+ appears on the next line.	spec_note1+#spec_note2 — Imports two spec note from a predefined source fields and displays the second note on a new line.

TIP You can use any combination of the string operators in an import link.

See Also

Example of Concatenated Sources (on page 95)

Formulas and Arithmetic Functions in Import Links

When defining the import mapping, as an alternative to using individual source table columns dragged from the **Source** pane of the **Import Link** window, you can also link together several values in the **Target** pane, in the **Source Name** column and use them as a single source. For example, the source used for the drawing name is **dwg + equip** which is a combination of the drawing ID and equipment ID (the '+' character is entered automatically if you select both sources by dragging them to the same data field).

The source can be composed of several different functions using the arithmetic operators (+, -, /, *) in addition to the string operators. The following conventions apply:

- Arithmetic operators are treated as such only in data fields whose table column type is **number**.

- Each arithmetic operator is preceded by the '!' character, for example:

param1 !+ param2 !- param3

(If the values are: param1 = 2, param2 = 10, and param3 = 5, the result of the above formula will be 7.)

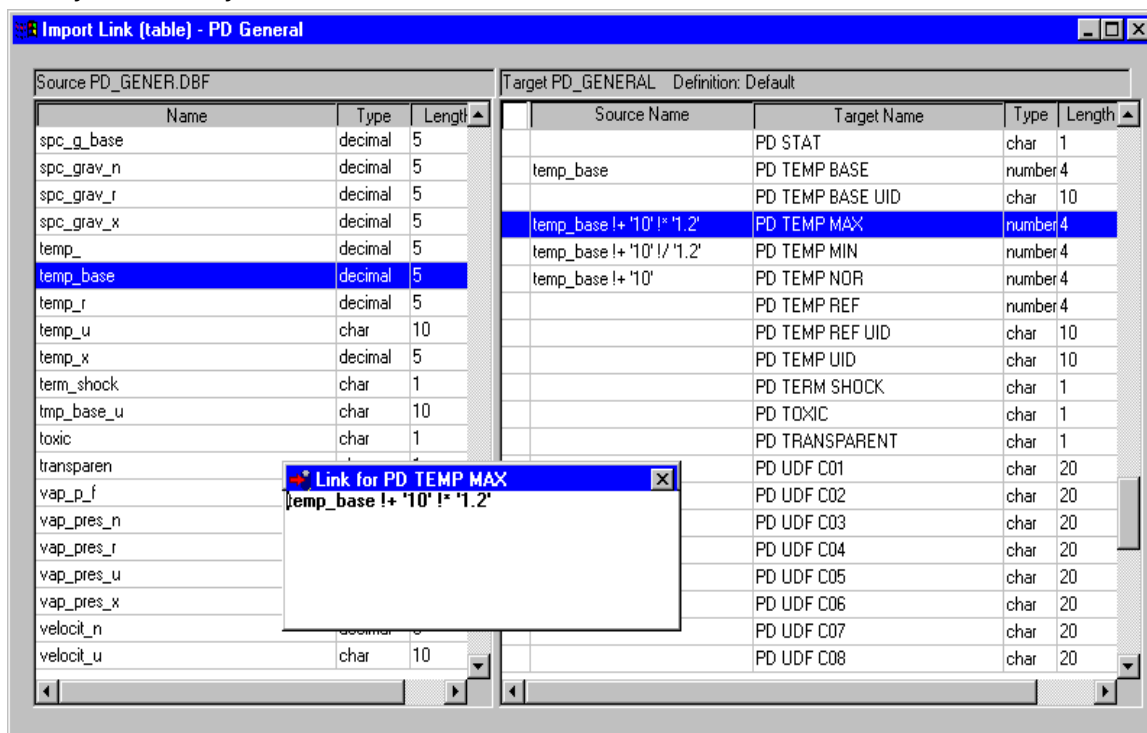
- Constants must be enclosed within single quotes, for example:
param1!+ '2' !* '5'

(Since the operations are performed from left to right, if the value of param1 is 2, the result of the above formula will be 20.)

In the following example, the fluid temperatures are calculated using the base temperatures in the following formulas:

- Normal temperature = Base temperature + 10
- Minimum temperature = (Base temperature + 10) / 1.2
- Maximum temperature = (Base temperature + 10) * 1.2

The syntax used by the **Source Name** data field is entered as follows:



See Also

Example of Concatenated Sources (on page 95)

Tag Class Mapping Codes for Instrument Index Import

In SmartPlant Instrumentation, if you have instruments belonging to more than one tag class, you must define a mapping value for the **Tag Class** (**CMPNT_CAT_ID**) column when defining an import link for COMPONENT table columns. In the database, CMPNT_CAT_ID is the column that contains the tag class ID numbers. Depending on the import method you selected on the **Link Definitions** dialog box, the **Import Link** window either displays **CMPNT CAT ID** (the definition in the database) or **Tag Class** (the definition in the SmartPlant Instrumentation interface):

- When defining a link for importing data using the Module method, the **Import Link** window displays **Tag Class** under the **Target Name** column and also displays **CMPNT CAT ID** under the **Column Name** column.
- When defining a link for importing data directly into the COMPONENT table, using the Single table method, the **Import Link** window only displays **CMPNT CAT ID** under the **Target Name** column.

The following table lists ID values for all possible instrument tag classes that SmartPlant Instrumentation supports. Note that there is no **4** value.

Tag Class (CMPNT CAT ID Column)	Mapping Code
Conventional	0
Telecom	1
Foundation Fieldbus	2
Typical	3
Electrical Signal Tag	5
Analyzer Component	6
Analyzer Stream	7
Functional Requirement	8
Foundation/Profibus PA virtual tag	9
Profibus DP	10
Profibus PA	11
HART Device	12
HART Signal	13
Soft Tag	14
Test Equipment	15

See Also

Import Instrument Index (on page 93)

Process Function Mapping Codes for Instrument Index Import

The following table lists the process functions that exist in SmartPlant Instrumentation and displays the corresponding codes that you must include in the import source in a separate column or define manually when mapping the PROC_FUNC_ID column in the PROCESS_FUNCTION table in the **Import Link** window.

Process Function	Mapping Code
General	0
Flow	1
Level	2
Pressure	3
Temperature	4
Analyzer	5
Control Valve	6
Relief Valve	7

WARNING Do not import data into the PROCESS_FUNCTION table. This might damage your database.

See Also

Import Instrument Index (on page 93)

Fluid State Mapping Codes for Process Data Import

The following table lists the fluid states that exist in SmartPlant Instrumentation and displays the corresponding codes that you must include in the import source in a separate column or define manually when mapping the **Fluid State** (PD_FLUID_PHASE) column in the PD_GENERAL table in **Import Link** window. Mapping the fluid state is required for process data import or specification import using the **Module (multiple tables)** import method.

NOTE In the Import Link window, the **Fluid State** (PD_FLUID_PHASE) column is also referred to as **Upstream Condition**.

Fluid State (PD_FLUID_PHASE)	Mapping Code
Gas/Vapor	G
Liquid	L
Steam	S
Water	W
Solid/Powder	P
N/A or other	O

See Also

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Create Specs Using the Module Import Method (on page 96)

Mapping Codes for Wiring Data Import

In SmartPlant Instrumentation, wiring items can appear either as reference items in the **Reference Explorer** or as <plant> items in the **Domain Explorer**. Therefore, when defining import mapping, you must first map the DEF_FLG flag. According to the DEF_FLG flag mapping, data that you import appears either in the **Domain Explorer** or **Reference Explorer** in SmartPlant Instrumentation. Each wiring item has a distinct mapping code that you must specify in the **Import Link** window. Depending on the mapping code, wiring items that you create appear under specific categories in SmartPlant Instrumentation. For example, if you want to import device panels, you must map the PANEL_CATEGORY column the PANEL table as 4 and also map the PANEL_SUB_CATEGORY column as 410 in the **Import Link** window.

The following tables list all the codes that you need to use for correct import of wiring data. You must either include the codes in the import source in a separate column or define the code values manually when mapping the wiring data columns in the **Import Link** window.

Mapping for the DEF_FLG Flag

DEF_FLG	Mapping Code	Note
<Plant> data import	N	In SmartPlant Instrumentation, the imported data appears in the Domain Explorer in the appropriate <plant>.
Cross cable data import	C	In SmartPlant Instrumentation, the imported cables appear in the Domain Explorer in the Cross Cables folder.
Reference data import	Y	In SmartPlant Instrumentation, the imported data appears in the Reference Explorer .

Mapping for the PANEL_CATEGORY Column in the PANEL Table

IMPORTANT After defining mapping for a panel category, you must also define mapping for the panel sub-category.

Panel Category	Mapping Code
Junction Box	1
Marshaling Rack	2
Cabinet	3
Device Panel	4
DCS	5
PLC	6

Mapping for the PANEL_SUB_CATEGORY Column in the PANEL Table

Panel Sub-Category	Mapping Code
Junction Box	110
Fieldbus Plug-and-Socket Junction Box	120
Splice Panel	130

Panel Sub-Category	Mapping Code
Patch Panel	140
Telecom Junction Box	150
Marshaling Rack	210
Distribution Frame	220
Cabinet	310
PA Cabinet	320
PABX Cabinet	330
Miscellaneous Cabinets	340
Hub Cabinet	350
Intercom Cabinet	360
Power Distribution Board	370
Device Panel	410
Telecom Plug-and-Socket Device Panel	420
Fieldbus Plug-and-Socket Device Panel	430
Telecom Device Panel	440
Multi-Input Device Panel with Plugs	450
Multi-input Device Panel Without Plugs	460
DCS	510
Safety System	520
PLC	610
Telecom Equipment	620

Mapping for the STRIP_CATEGORY Column in the PANEL_STRIP Table

Terminal Strip Category	Mapping Code
Regular Terminal Strip	0
Plug-and-Socket Box	2
Connector	6
Switch Port (Telecom)	7
Apparatus	8

Mapping for the TERMINAL_CATEGORY Column in the PANEL_STRIP_TERM Table

Terminal Category	Mapping Code
Regular Terminal (General)	G
Apparatus Right Terminal	R

Terminal Category	Mapping Code
Apparatus Left Terminal	L
Apparatus Left and Right Terminal	H

Mapping for the CABLE_CATEGORY Column in the CABLE Table

Cable Category	Mapping Code
Fieldbus Home-Run	H
Conventional	R
Telecom	T

Mapping for the APPAR_CAT_ID Column in the APPARATUS Table

Wiring Equipment Category	Mapping Code
Miscellaneous Wiring Equipment	0
I/O Card	1
I/O Termination	2
Hub	4
Intercom	5
Switch	6
Miscellaneous Telecom Equipment	7
Fieldbus Brick	8
Isolator	9
Safety Barrier	10
Relay	11
Trip Amplifier	12
Amplifier	13

Mapping for the CHANNEL_CATEGORY Column in the CHANNEL Table

Channel Category	Mapping Code
Conventional	G
Apparatus	H
I/O Channel	I

Import Data Comparison

After you have run an import session on a set of data at least once, you can run subsequent sessions by comparing the new rows to be imported with previously imported rows. You can do this on the **Import Comparison List** dialog box as well as on the **Comparison** tab of the **Link Properties** dialog box. You can also start transferring data after you have selected specific rows that you want to import from the source to the target.

NOTE When importing a satellite project back to the host project, changes made to reference data (redlining, drawing item positions, certain supporting tables and so-forth) on Enhanced Report Utility drawings are not imported back to the host project.

See Also

Target Table Definition (on page 43)

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Setting the Import Comparison List Options

During the import process the Import Utility modifies the contents of the SmartPlant Instrumentation database (for example, the target module or table). This is done by inserting, deleting and updating rows in the SmartPlant Instrumentation database. It is therefore advisable to be able to coordinate between these rows before you start the import process.

This feature provides you with the means to coordinate between the rows to be inserted, deleted or updated during the import process. You do this by reviewing the source and target rows and selecting the appropriate rows which will be processed during the import process.

NOTE The **Comparison** tab only becomes active after the first time you have imported data and saved the selected link.

See Also

Import Comparison (see "Import Data Comparison" on page 73)

Preview and Print the Source and Target Rows (on page 75)

Target Table Definition (on page 43)

Comparison Options Common Tasks

The following tasks are used when you compare import data against data already imported.

View the Source and Target Rows

Use this procedure to view the source and target rows according to the selection you made, or per process (for example, rows that will be inserted, rows that will be deleted, and so forth). For more information, see *View the Source and Target Rows* (on page 74).

Filter the Displayed Target Rows

Use this procedure to filter the target rows displayed on the **Import Comparison List** dialog box. Filtering the target rows this way does not affect the target rows currently selected to be included in the import process. For more information, see *Filter the Displayed Target Rows* (on page 74).

Preview and Print the Source and Target Rows

Use this procedure to preview and print out the source and target rows displayed on the **Import Comparison List** dialog box. For more information, see *Preview and Print the Source and Target Rows* (on page 75).

Import Data Using the Comparison List

Use this procedure to import data using the comparison list. For more information, see *Import Data Using the Comparison List* (on page 75).

View the Source and Target Rows

1. On the **Import Comparison List** dialog box, under **Show**, do one of the following:
 - Select **All** to view all target rows.
 - Select the **Selected** option to view only the selected target rows. Selecting this option displays only the rows you have previously selected.
 - Select **By mode** to view the displayed rows according to their import mode.
2. If you selected the **By mode** option, under **Import mode**, do one or more of the following:
 - Select **Inserted** to select all the source rows whose status is **Insert** (for example, the letter **I** appears in the **Mode** column).
 - Select **Updated** to select all source and target rows whose status is **Update** (for example, the letter **U** appears in the **Mode** column).
 - Select **Deleted** to select all source rows whose status is **Delete** (for example, the letter **D** appears in the **Mode** column).
 - Select **Refreshed** to select all source and target rows whose status is **Refresh** (for example, the letter **R** appears in the **Mode** column).

TIP You can select more than one import mode by which the data in the data window will be displayed. This way you show the source and target data by more than one import mode.
3. Click **Display** to display rows in the **Comparison data** pane according to the specified filtering options.

Filter the Displayed Target Rows

- At the bottom of the **Import Comparison List** dialog box, click **Filter** to open the **Import Target Filter** dialog box.

TIP The source table columns available in this data window are only the ones currently displayed in the **Import Comparison List** dialog box. These are the same table columns that you linked in the **Import Link** window.

See Also

Specify a Filtering Condition (on page 27)

Preview and Print the Source and Target Rows

1. At the bottom of the **Import Comparison List** dialog box, click **Report**.
2. On the **Print Preview** dialog box, view the displayed data.

TIP Placing the cursor on the scroll box displays the current page number. Scroll the box down in the scroll bar to display the total number of pages that the printout includes.
3. Click **Print**.

Import Data Using the Comparison List

1. Do one of the following:
 - In the **Import Link** window for a table or module, click .
 - Specify the deviation options on the **Comparison** tab of the **Link Properties** dialog box. This method applies only if you started this import session using a saved link.
2. In the **Import Comparison List** dialog box, under **Show**, click **All** to display all the data rows.

TIP If you have already defined a source filter condition in this session (in the **Link Properties** dialog box), only the source rows which comply with this condition will be displayed in the **Import Comparison List** dialog box. See *Specify a Filtering Condition* (on page 27) for details.
3. Select the required data rows to be processed for import by doing one of the following:
 - Select the check box in the **Select** column for each row you want to include.
 - In the **Select rows** section, click the **All** button to select all the rows.
 - In the **Select rows** section, select one or more of the check boxes to include all the rows where the mode corresponds to the selection.
4. Select **Re-open the Comparison List**.

TIP Rows where data was changed are highlighted in light blue.
5. Click **Test** to check the import process without actually saving data to the target table.
6. Modify the link mapping, if required, to correct any errors.
7. Click **Run** to import the data.

System Codes

When importing data from a non-SmartPlant Instrumentation database that uses system or unit of measure codes different from the ones used in your target SmartPlant Instrumentation database, you are required to adapt the source system and unit of measure codes to the codes used in your target SmartPlant Instrumentation database. This feature can also be used to adapt system and unit of measure codes of a SmartPlant Instrumentation source domain, when importing data from one SmartPlant Instrumentation domain to another.

Suppose a source table contains a code (for example, **A**) that is used as a reference in another source table. This code may be different from the one used in your corresponding target SmartPlant Instrumentation database (for example, **psia**). Therefore, prior to running import, you have to make the appropriate adaptations for the system codes and unit of measure codes.

NOTE If you want to use system codes in your current import session, you must select the appropriate source system and adapt its code prior to starting the import of data (see the procedure below for details). Also note that the target code values are predefined in the system and cannot be modified. When importing process data and/or calculation data and the units of measure are not defined, the Import Utility will insert default unit of measure values belonging to the SmartPlant Instrumentation <unit> with which the imported tag data is associated.

To adapt source system and unit of measure codes you need to do the following:

- Select the source system whose codes you want to adapt. for details, see *Define Source Systems* (on page 77).
- Adapt the source codes to the target codes. for details, see *Adapt System Codes* (on page 78).

Using this feature you can also keep the code adaptation data in a text file (with a .cds extension) and use it in future import sessions. You can do the following:

- Import a code file that contains adapted system codes, unit of measure codes or both. For details, see *Import Codes* (on page 79). Importing codes this way does not overwrite the current code adaptations.
- Export a code file that contains adapted system codes, unit of measure codes or both. For details, see *Export Codes* (on page 80).
- Display the name of the source system set as the currently source system. For details, see *View the Currently Selected Source System Name* (on page 80).

See Also

System Codes Table (on page 116)

Unit of Measure Codes Table (on page 125)

Working with System Codes Common Tasks

The following tasks are used when you import data from a non-SmartPlant Instrumentation database that uses system or unit of measure codes different from the ones used in your target SmartPlant Instrumentation database.

Define Source Systems

Before you can adapt the source codes to comply with the target codes, you need to specify the source systems whose codes you want to adapt. At this stage, you also select the current source system whose codes you want to use during the current import session. For more information, see *Define Source Systems* (on page 77).

Adapt System Codes

Use this procedure to adapt the codes which are not associated with units of measure to the codes that are used in the target SmartPlant Instrumentation database. Several source code values can be represented by a single target code value. For example, the source code values **AA**, **BB**, **CC**, **DD** can be represented by (adapted to) a single target code: **XX**. For more information, see *Adapt System Codes* (on page 78).

Adapt Unit of Measure Codes

This procedure shows you how to adapt unit of measure codes for SmartPlant Instrumentation. For more information, see *Adapt Unit of Measure Codes* (on page 78).

Import Codes

This feature allows you to import from the same code file (with a .cds extension) both the system codes and the unit of measure codes or just one of them, depending on whether these codes exist

in the ASCII file you are going to use. This way you can use code adaptation settings that were previously saved in files without having to redefine the code adaptation for every case. For more information, see *Import Codes* (on page 79).

Export Codes

This feature allows you to export the current code settings of any selected source system to a code file (with a .cds extension). You can export both the system codes and the unit of measure codes or just one of them. This way you can keep code adaptation settings in a file and use them in future import sessions without having to redefine the code adaptation for every case. For more information, see *Export Codes* (on page 80).

View the Currently Selected Source System Name

This option enables you to view the currently selected source system name. For more information, see *View the Currently Selected Source System Name* (on page 80).

Use Source Codes in an Import Link

After you have adapted unit of measure codes and system codes, this procedure describes how to use them in your import links. For more information, see *Use Source Codes in an Import Link* (on page 80).

See Also

System Codes Table (on page 116)

Unit of Measure Codes Table (on page 125)

Define Source Systems

1. On the **System Codes** menu, click **Select Source System**.
2. In the **Source System List** dialog box, do one of the following:
 - Add a new source system (see step 3).
 - Edit an existing source system name (see step 4).
 - Delete an existing source system (see step 5).
 - Select the current source system (see step 6).
3. To add a new source system, do the following:
 - a. Click **New**.
 - b. Click in the highlighted line.
 - c. Type the new source system name.
4. To edit an existing source system name, do the following:
 - a. In the data window, highlight the source system whose name you want to modify.
 - b. Click **Edit** to make the line selected in the data window.
 - c. Edit the source system name as required.
5. To delete an existing source system, do the following:
 - a. In the data window, highlight the source system you want to delete.
 - b. Click **Delete** to delete the line selected in the data window.
 - c. To select the current source system, in the data window, highlight the required line.
6. Click **OK**.

Adapt System Codes

NOTE You can adapt system codes and unit of measure codes only if you selected a source system. For a list of system codes you can adapt, see *System Codes Table* (on page 116).

1. Click **System Codes > Adapt System Codes**.
2. In the **Source System List** dialog box, select the source system whose codes you want to adapt. The available source systems are the ones you entered in the **Source System List** dialog box.
3. In the **Adapt System Codes** dialog box, under **Module**, do one of the following:
 - Click **All** to make all properties available.
 - Click the SmartPlant Instrumentation module whose properties you want to make available (**Process Data**, **Wiring**, or **Calculation**).
 - Click **Other** to make the properties available for all modules except for Process Data, Wiring, and Calculation.
4. From the **Code Values** list, select the property whose codes need adapting.
5. To set the code values, do the following:
 - a. In the data window, click the **Source Code** field of the appropriate code. The selected **Source Code** field becomes editable (if the field color was light blue, it changes to white).
 - b. Type the source value corresponding to the target system code value.
 - c. To clear the currently selected source system code value, click **Unused**.
 - d. To specify an additional source system code value for the target system code value currently selected in the data window, click **Duplicate** and type an additional value in the **Source Code** column of the new row.

TIP You can only set the values of source codes where the **Source Code** field color is either light blue or white.
6. Repeat steps 3 through 5 for every required SmartPlant Instrumentation module.
7. Repeat steps 2 through 6 for other source systems whose codes need adapting.
8. Click **OK** to close the **Adapt SystemCodes** dialog box.

Adapt Unit of Measure Codes

NOTE You can adapt system codes and unit of measure codes only if you selected a source system. For a list of system codes you can adapt, see *Unit of Measure Codes Table* (on page 125).

1. Click **Codes > Adapt Unit of Measure Codes**.
2. On the **Adapt Unit of Measure Codes** dialog box, from the **Source System** list, select the source system whose codes you want to adapt. The available source systems are the ones you entered on the **Source System List** dialog box.
3. From the **Unit of measure type** list, select the unit of measure category whose codes need adapting.
4. To set the code values, do the following:
 - a. In the **Codes** pane, click the **Source UOM Code** field of the appropriate code.

TIP You can only set the values of source codes where the **Source UOM Code** field color is either light blue or white.
 - b. Type the source value which corresponds to the target unit of measure code value.
 - c. Click **Unused** to clear the currently selected source unit of measure code value.

- d. Click **Duplicate** to specify an additional source unit of measure code value for the target unit of measure code value currently selected in the data window.
5. Repeat steps 3 and 4 for every required SmartPlant Instrumentation module.
6. Repeat steps 2 through 5 for other source unit of measure whose codes need adapting.
7. Do one of the following:
 - Click **OK** to save the changes you made to the current unit of measure code settings and close the **Adapt Unit of Measure Codes** dialog box.
 - Click **Apply** to save the changes you made to the current unit of measure code settings and keep the **Adapt Unit of Measure Codes** dialog box open. This way you can save the portion of the work you have done so far and keep working with the **Adapt Unit of Measure Codes** dialog box.

See Also

Unit of Measure Codes Table (on page 125)

Adapt Unit of Measure Codes - Special Characters

To type power indexes (for example, 2 as in cm²) and other special characters (for example, as in C), do the following:

1. Run the Windows Character Map utility and select the appropriate character to copy, and then, click the **Copy** button.
2. Do one of the following:
 - Switch to the Import Utility and paste the character in the required location.
 - Hold down **Alt** and, with the Num Lock indication on, type the required character's ASCII value (a four-digit number) using the keyboard numeric keypad (see your Windows User Guide for additional information about ASCII numbering).

For example:

Type **Alt** + 178 to add: 2

Type **Alt** + 179 to add: 3

See Also

Unit of Measure Codes Table (on page 125)

Import Codes

NOTE Importing codes from an external file **does not** overwrite existing code settings.

1. Click **Codes > Import Codes**.
2. On the **Import Codes** dialog box, do one of the following:
 - Under **File**, type the full path and filename of the ASCII file from where you want to import the codes, if you know it.
 - Click **Browse** to navigate to the desired file.
3. Under **Import data**, select the code type you want to import: system codes, unit of measure codes, or both.

TIP The code type that will be imported depends on whether the file you selected in step 2 in this procedure actually contains the code type that you select in the **Import data** section.
4. Click **OK** to import the selected codes.

Export Codes

1. Click **Codes > Export Codes**.
2. On the **Export Codes** dialog box, select one or more source systems whose code settings you want to export to a .cds file. To clear a system, click it again.
3. Under **Export data**, select the code type you want to import: **System codes**, **Unit of measure codes**, or both.
4. Click **OK**.
5. On the **Enter Export File Name** dialog box, select the file where you want to keep the codes of the system you selected in step 2 in this procedure.
6. Click **Save** to export the codes to the selected file.

View the Currently Selected Source System Name

- Click **Codes > Current Source System**.

Use Source Codes in an Import Link

1. In the **Link Explorer**, select the link where you want to use source codes.
2. Click **Actions > Properties**.
3. On the **Link Properties** dialog box, click the **Source** tab.
4. Select **Use system codes**.
5. Click **OK**.
6. In the **Update** mode, if prompted to use the overwrite option, click **Yes**.
7. Open the link which you want to use to import your data.
8. Define the link mapping by dragging the appropriate source names to the target window.
9. In the **Import Link** window link, select the check boxes in the target window under the **Code** column for those link parameters for which you want to use source codes.

TIP To use all available source codes in the link, on the menu bar, click **Actions > System Codes > Check All**.

Data Import Prerequisites

Before importing data into SmartPlant Instrumentation, the following general prerequisites must be met:

- There must be a target SmartPlant Instrumentation domain containing at least one plant hierarchy item at the lowest level of the hierarchy (by default, this is a <unit>). You create plant hierarchy items in the Administration module.
- There must be a naming convention for instruments and loops in each target <unit>. This is necessary only if you intend to work with tables whose columns require naming conventions (for example, COMPONENT, LOOP). You set naming conventions in the Administration module.
- In SmartPlant Instrumentation, you must specify the valid Temporary folder path on the **General** page of the **Preferences** dialog box.

- If you are importing from SmartPlant P&ID, SmartPlant P&ID must be closed before starting the import session, to ensure that any modifications made to the drawings are properly imported to SmartPlant Instrumentation.

IMPORTANT

- When importing a satellite project back to the host project, changes made to reference data (redlining, drawing item positions, certain supporting tables and so-forth) on Enhanced Report Utility drawings are not imported back to the host project.
- The software does not update the PLANT table, which contains the active item library designation. Therefore, when importing hook-up data, if the active item library designation was changed in the source, you must select the active item library manually after performing the import in order to be able to continue to work with the data.

See Also

Import Links (on page 15)

Prerequisite for Importing Instrument Types (on page 90)

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Matching Naming Conventions

It is very important to adjust the import links so that they match the naming conventions of tags and loops used in the domain into which you are about to import data.

For example, in the SmartPlant Instrumentation demonstration domain, the naming convention structure of conventional instruments is as follows:

101-AAAA-BBBB

In this convention, **101** is the <unit> number prefix, **AAAA** represents the instrument type segment and **BBBB** represents the tag number segment; the hyphens are segment separators. Therefore, an instrument with tag number **101FE22212** is represented in the demonstration domain as **101-FE -2212**.

Before starting the import setup process, you need to pay attention to the source table columns that construct the source instrument and loop and how they match the SmartPlant Instrumentation instrument and loop data.

When you select an import link that is associated with either instruments or loops, you are prompted to define the naming convention structure.

CAUTION When redefining the naming convention structure, make sure that no data redundancy is created. Such a redundancy may be caused, for example, if the source table columns use data segments that are shorter than those used in the target table columns. For example, the source tag number **101PS2212** uses only a two-character table column for the instrument type. In SmartPlant Instrumentation, this tag number appears as **101-PS – 2212**. This situation may cause a data redundancy problem, since this tag number can stand for either **101-PSH -2212** or **101-PSL-2212**.

Importing Data Common Tasks

The following tasks are used when testing data import and when importing data.

Test the Import Process

You can run a test of the import process according to the parameters you have set in the **Import Link** window. The software tests the import process without carrying out the actual import of data, for example, without inserting, updating or deleting rows of the SmartPlant Instrumentation database.

Testing the import process can be useful when testing a single link before carrying out a large batch operation. A test can also give you an indication on the rejected rows and allow you to fix the problem prior to a batch operation. A test run is carried out slightly faster than the actual import operation. For more information, see *Test the Import Process* (on page 82).

Run an Import Session from the User Interface

Use this procedure to run an import session from the Import Utility. The data import process involves creating links that map between the source and the target tables. After defining the links, you perform the actions that import the data into SmartPlant Instrumentation. For more information, see *Run an Import Session from the User Interface* (on page 83).

Run an Import Session from the Command Line

You can use command-line parameters to start an import session that executes an existing import link. This way you can import data using the settings in the selected link without having to open the Import Utility. For more information, see *Run an Import Session from the Command Line* (on page 84).

Disable Test Mode

Use this procedure if you do not want to perform any import tests. Note that disabling the test mode results in actual data import when trying to test an import process. For more information, see *Disable Test Mode* (on page 85).

See Also

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Test the Import Process

CAUTION Make sure that, in the [Database] section of the Intools.ini file, the following parameter setting appears: **AutoCommit= 0**. If the parameter setting is **AutoCommit=1**, the test mode is disabled and trying to test the import process results in actual data import.

1. Define a log file, if you have not yet done so.

TIP You can perform a test run of a sub-set of the selected source and target data by applying the appropriate filtering condition to the data (see *Specify a Filtering Condition* (on page 27)) or partially linking the source and target data (see *Define the Import Mapping* (on page 64)).

2. With the **Import Link** window open, on the toolbar, click  (**Test**) to start testing the import process.
3. On the **Import Progress Test** dialog box, which opens automatically, view the expected import process results.

TIP The test results are inaccurate when you import data in a group of links of which some links are related as in the example: cable, cable set, and wire. Also, the test results are inaccurate when you import one or more source tables containing multiple prime values.

Run an Import Session from the User Interface

CAUTIONS

- We recommend proceeding cautiously with the import process, as some of the Import Utility features change the structure and contents of the target database.
- The import process is irreversible: once you carry out the import process, you cannot undo the changes import made to the target database. We therefore recommend that you first use the test mode to check the import process before carrying out the actual data transfer. The test results provide you with information about the expected outcome of the actual import process. For details, see *Test the Import Process* (on page 82).

IMPORTANT

- Before importing data, familiarize yourself with import prerequisites. For details, see *General Import Prerequisites* (see "Data Import Prerequisites" on page 80). Also, if you intend to import a large number of records (more than 400 records) in one import session, you must create a new section in the Intools.ini file called [Rules] and add the following parameter: **disable=y**.
- If you are importing from SmartPlant P&ID, SmartPlant P&ID must be closed before starting the import session, to ensure that any modifications made to the drawings are properly imported to SmartPlant Instrumentation.

1. Select the import method, which can be either **Module (multiple tables)** or **Single table**.
2. Select the target SmartPlant Instrumentation table or module for the import.

IMPORTANT When importing data to tables, the order of the import is important. You should first import data into a table that the next table refers to. For example, before importing data into the **COMPONENT** table, you should import data into the **COMPONENT_LOCATION** table, if you want to import both instrument locations and instrument tag numbers.

3. Define the import link properties as you require, using the **Link Properties** dialog box options. For details, see *Defining Import Link Properties Common Tasks* (on page 24).
4. Establish a link between the source and the target data. You can do one of the following:
 - Use an existing link that was saved previously
 - Build a new link and save it (see step 5).
5. To build a new link, do the following:
6. Set the appropriate parameters for the import.
7. Where appropriate, define the structure of the import link.
8. Define the link mapping between the source and the target table columns.

TIPS

- You can modify the source definition after creating the link to insure that all required data exists in your source database. Use the SmartPlant Instrumentation Data Dictionary to help you identify target SmartPlant Instrumentation tables.
 - If required, you can reset the import order as well as select the reference tables to import. To learn how to control the import order, see *Target Table Definition* (on page 43).
9. Run an import test (recommended) For details, see *Test the Import Process* (on page 82).
 10. Perform the import process by clicking  in the **Import Link** window.

11. On the **Import Progress** dialog box, review the following information:

Data Field	Description
Source Table Rows: Total / Current	The total number of rows and number of rows currently imported in the currently selected source table.
Target Table Rows	The number of rows of the current table that have already been processed by the Import Utility during the current import session, according to their status: Inserted, Updated, Deleted, or Rejected.
Tables / Rows in current table (progress bars)	The percentage of data which has already been processed for an import link assigned to the Module (multiple tables) method for the entire module and for the table currently being processed.
Progress bar	The percentage of data which has already been processed for an import link assigned to the Single table method.
Cancel	Stop the import process during execution.
Report	View the report on rejected rows. This button is available only if any rejected rows occurred and if you selected the Rejected data report check box on the Link Properties dialog box. This option allows you also to generate a hard copy of the current report. This button becomes active only after the import process was stopped or was completed.
Information	View the import process information: the target table name and the row count before and after import. This button becomes active only after the import process was stopped or was completed.

Run an Import Session from the Command Line

IMPORTANT If you are importing from SmartPlant P&ID, SmartPlant P&ID must be closed before starting the import session, to ensure that any modifications made to the drawings are properly imported to SmartPlant Instrumentation.

1. On the Windows **Start** menu, click **Run**.
2. On the **Run** dialog box, type the following string on the same line:
<home folder>\import <user name>,<password>,<domain>, <plant>, <intermediate plant hierarchy item 1>/<intermediate plant hierarchy item 2>/<intermediate plant hierarchy item 3>...,<unit>,<link> – or – @<link group>,<project>

The string segments in chevrons stand for the following parameters:

- **home folder** — The SmartPlant Instrumentation home folder.
- **user name, password** — The Domain Administrator's username and password.
- **domain** — The name of the target domain.
- **plant** — The name of the plant or equivalent highest level item in the plant hierarchy.
- **intermediate plant hierarchy item 1/ intermediate plant hierarchy item 2/ intermediate plant hierarchy item 3...** — when you want to import source data from

multiple plant hierarchies into the target plant hierarchy and the intermediate plant hierarchy has two or more levels, use the character defined in the Administration module as the plant hierarchy separator for the domain, for example, /. If no separator is defined in the Administration module, use / as the default.

- **unit** — The name of the unit or equivalent lowest level item in the plant hierarchy.
- **import link** — The name of the import link you want to execute in the current import session.
- **link group** — The name of the group whose links you want to execute in the current import session. When used, this parameter is always preceded by a commercial sign @.
- **project** — The name of the target project when working in an owner operator domain.

Examples

The following are two examples of using the command line syntax.

- a. Importing data to the demonstration domain by executing a link named **Flow** in an owner operator domain:

```
import DBA,DBA,Demo Domain, Plant 1 - DEMO, Main Building/North/Room 1, Unit 3, Flow, Demo Project.
```
- b. Importing data to the demonstration domain by executing all the links in a group named **Process Data** in an engineering company (EPC) domain:

```
import DBA, DBA, Demo Domain, Plant 1 - DEMO, Main Building/North/Room 1, Unit 3, @ Process Data.
```

IMPORTANT

- The parameter strings must be typed on the same line.
- Plant hierarchy item names into which you intend to import data must not contain slash / characters because the software interprets these characters as separators between successive hierarchy levels.

3. Press **Enter**.

You see the links that you specified in the statement being carried out.

Disable Test Mode

CAUTION We do not recommend that you disable the test mode unless absolutely necessary. Disabling the test mode results in actual data import when trying to test an import process.

1. Open the Intools.ini file.

TIP The default location for the Intools.ini file is the SmartPlant Instrumentation home folder.

2. In the [Database] section, change AutoCommit=0 to AutoCommit=1.

Importing Data into Multiple Plant Hierarchy Items or Projects

You use the **Import Level** tab options when you need to import source data to a domain with multiple plant hierarchy items or to an owner operator domain that has As-Built and multiple projects. In your import source, you need to define the projects names and the plant hierarchy items exactly as they appear in your target domain. In an owner operator domain, projects are always implemented per <plant>. Several projects can be associated with the same <plant> and even share the same hierarchy levels or belong to different plants in the domain.

When importing data that includes more than one plant hierarchy item, some of the source rows may recur (due to the existence of several plant hierarchy items). In this case, you can instruct the Import Utility to differentiate rows of different plant hierarchy items during the import process, thus importing data into the appropriate plant hierarchy items. When you select to import data into multiple plant hierarchy items, you can also specify the level of import, for the Import Utility to differentiate rows per <plant>, per <area> or per <unit>.

If you select to import data per <plant> or per <area>, the Import Utility rejects rows defined per <unit>. If you do not specify a plant hierarchy level, the Import Utility rejects all recurring source rows during the import process. In this case, the Import Utility does not differentiate between rows of different plant hierarchy items. After you select the level for which the Import Utility distinguishes unique data during the import process, you need to select the naming convention to be used during the import process.

In SmartPlant Instrumentation, database tables are defined per plant hierarchy item. When a table is defined at a specified level, it contains data which is unique at that level.

Data Import at the Highest Level

If you select to import data per <plant>, the Import Utility distinguishes only rows of different <plants> during the import process. The Import Utility rejects rows of different <areas> and <units> if a plant contains more than one <area> and <unit>. For example, the CABLE table is defined per <plant>. Therefore the CABLE table contains data which is unique only at the plant level.

Data Import at the Intermediate Level

If you select to import data per <area>, the Import Utility distinguishes only rows of different areas during the import process. The Import Utility rejects rows of different <units> if an <area> contains more than one <unit>.

Data Import at the Lowest Level

The target table is CHANNEL (a table defined per <plant>) and you select on the **Import Level** tab the <unit> level. In this case the AREA_ID and UNIT_ID table columns become Foreign Key columns in the CHANNEL Table.

Primary Key and the Foreign Key Column Definitions

The Import Utility defines the Primary Key and the Foreign Key columns of the target table, which you selected on the **Link Definitions** dialog box, in three possible ways:

You select the same import level as the level of the target table (this is the default option): in this case only the table columns regarding this level (for example, UNIT_ID, AREA_ID, and so forth) is automatically defined by the Import Utility as a Primary Key in the target table.

For example:

The target table is COMPONENT (a table defined per <unit>) and you select on the **Import Level** tab the <unit> level: the UNIT_ID table column is also defined as a Primary Key column in the target table.

You select a higher import level than the level of the target table: in this case all the table columns regarding the level of the target table and the levels above (for example, PLANT_ID, AREA_ID) will be automatically defined as Primary Key columns in the target table.

For example:

The target table is COMPONENT (a table defined per <unit>) and you select on the **Import Level** tab the <area> level. In this case both the AREA_ID table column and the UNIT_ID table column become Primary Key columns in the COMPONENT Table.

You select a lower import level than the level of the target table: In this case all the table columns regarding the level you select and the levels below will be automatically defined as Foreign Key columns in the target table.

Importing Data into Multiple Plant Hierarchy Items or Projects Common Tasks

The following tasks are used when you import data into multiple plant hierarchy items or projects.

Import Data Into Multiple Plant Hierarchy Items

This procedure shows you how to import data into multiple plant hierarchy items or projects. For more information, see *Import Data Into Multiple Plant Hierarchy Items* (on page 87).

Import Data into Several Projects

This procedure shows you how to import data into several projects. For more information, see *Import Data into Several Projects* (on page 88).

See Also

Run an Import Session from the Command Line (on page 84)

Import Data Into Multiple Plant Hierarchy Items

1. In your import source, do the following:
 - a. Define the plant hierarchy items if you use more than one plant hierarchy in your projects.
 - b. For each plant hierarchy item, define data you want to import.

TIP Make sure the plant hierarchy item names or <unit numbers> are exactly the same as in the target domain.
2. In the Import Utility, create the import link for the import source containing your target plant hierarchy item definitions.
3. On the **Link Properties** dialog box, click the **Import Level** tab, and then, do the following:
 - a. Under **Hierarchy levels**, select the desired plant hierarchy level.
 - b. If you want to import data to several <units> in your plant, under **Import unit data using**, select **Unit name** or **Unit number**, depending on the definitions in your import source.
 - c. Click **OK** to close the **Link Properties** dialog box.
4. Open the link in the **Import Link** window and make your link definitions as you require.
5. Test and import data to the target projects.

Import Data into Several Projects

1. In your import source, do the following:
 - a. Define the project names exactly as they appear in your target domain.
 - b. Define the plant hierarchy items if you use more than one plant hierarchy in your projects.
 - c. For each project, define data you want to import.

TIP You can also include As- Built in the import source. Make sure the name As- Built in the import source appears exactly as in SmartPlant Instrumentation.
2. In the Import Utility, create the import link for the import source containing your target project definitions.
3. On the **Link Properties** dialog box, click the **Import Level** tab, and then, do the following:
 - a. Under **Hierarchy levels**, select the desired plant hierarchy level that the target projects contain.
 - b. If the lowest plant hierarchy item in your projects is not the same, under **Import unit data using**, select **Unit name** or **Unit number**, depending on the definitions in your import source.
 - c. Select **Specify target projects in link**.
 - d. Click **OK** to close the **Link Properties** dialog box.
4. Open the link in the **Import Link** window, and, depending on the import method, do one of the following:
 - If the import method is **Single table**, link your source project table definition to the **ENGINEER NAME/ENG PROJ ID** field in the **Target Name** column.
 - If the import method is **Module (multiple tables)**, link your source project table definition to the **Engineering Project Name** field in the **Target Name** column.
5. Complete making the import link definitions as you require.
6. Test and import data to the target projects.

NOTE When importing a satellite project back to the host project, changes made to reference data (redlining, drawing item positions, certain supporting tables and so-forth) on Enhanced Report Utility drawings are not imported back to the host project.

Importing Instrument Index Data Common Tasks

The following tasks are used when importing instrument tags and loops.

Enable Creation of Complementary Elements for Instrument Index

If on the **Link Definitions** dialog box, under Import method, the Instrument Index module or instrument index-related table is selected as the import target, the **General** tab of the **Link Properties** dialog box displays an additional section called **Create complementary elements**. The options in this section allow you to set the software to import instrument tags according to the instrument type profile definitions. You can enable the following elements for instrument index import:

- A device panel and a cable for an instrument whose instrument type profile includes wiring, and which has the following default elements: panel, cable, and connection type.
- A document number row and a default revision row (which is initially empty) in the **DRAWING** table for a specification, process data sheet and calculation sheet.
- Instrument associations with the appropriate I/O type, locations and hook-ups.

For more information, see *Enable Creation of Complementary Elements for Instrument Index* (on page 91).

Set Source Fields as Instrument Type Fields

This procedure is useful if your import source does not contain instrument types or instrument type descriptions and you want to create new instrument types and descriptions in SmartPlant Instrumentation when importing tag numbers. This procedure allows you to define one or more source columns as columns for importing instrument type abbreviations and descriptions. To each field in the source column, you must assign a process function. After that, when you open the **Import Link** window, you do not have to define mapping for the process function and instrument type fields. The process function macro **@PROC_FUNC_NAME** appears in the **Source Name** column mapped to the **PROC_FUNC_NAME** column. When importing tag numbers, the software runs the macro to import the instrument type abbreviations and descriptions using the fields you set as the instrument type fields and associate the imported tag numbers with the appropriate instrument types.

In SmartPlant Instrumentation, the instrument type of a tag is abbreviated and therefore needs to be associated with a description that provides more information about that instrument type, for example, the default instrument type **FV** description is **Flow Valve**. An instrument type abbreviation does not have to be unique. For example, in SmartPlant Instrumentation, **FE** stands for either **Flow Element** or **Mass Flow Sensor**. The combination of the instrument type abbreviation and description provides a unique identifier for a tag instrument type. For more information, see *Set Source Fields as Instrument Type Fields* (on page 91).

Associate Source Fields with Existing Instrument Types

This procedure is useful if your import source does not contain instrument types or instrument type descriptions and all the instrument types and descriptions that you require already exist in SmartPlant Instrumentation. This procedure allows you to set one or more source columns as columns containing instrument type fields and associate each field with a combination of instrument type abbreviation, description, and process function that exists in SmartPlant Instrumentation. After that, when you open the **Import Link** window, you do not have to define mapping for the process function and instrument type fields. The process function macro **@PROC_FUNC_NAME** appears in the **Source Name** column mapped to the **PROC_FUNC_NAME** column. When importing tag numbers, the software runs the macro and the imported tag numbers are associated automatically with the appropriate instrument types. For more information, see *Associate Source Fields with Existing Instrument Types* (on page 92).

Associate Tag Numbers with Correct Instrument Type Descriptions

The instrument type of a tag is an important part of the initial information for building a tag. This is true both when working with SmartPlant Instrumentation as an application as well as when entering tags using the Import Utility. The instrument type information is designated in the function part of the instrument tag (for example, 100- FY400). Sometimes the source data lacks an instrument type description, for instance, there is an FY function type name that is an I/P Converter and also a Solenoid Valve. This procedure enables you to specify that each that that you import is automatically associated with the instrument type description that you require.

Import Instrument Index

Use this procedure to import instrument tags into SmartPlant Instrumentation using the **Module (multiple table)** import method. This procedure is useful if you have not yet defined your instrument index in SmartPlant Instrumentation. For more information, see *Import Instrument Index* (on page 93).

Import Instrument Properties

Use this procedure to import one or more properties of instrument tag numbers. In this procedure, you use the **Single table** import method and select the **COMPONENT** table as the target table for data import. This procedure is useful if you have already created instrument index in SmartPlant Instrumentation and only need to assign certain properties to a large number of existing tag numbers. These properties can be custom field values, supporting table values, or text string properties, such as Service, Note, and so forth. For more information, see *Import Instrument Properties* (on page 94).

Prerequisite for Importing Instrument Types

The current prerequisite only applies if you want to define instrument types in your source and do not want to map them to instrument types shipped with SmartPlant Instrumentation. Before defining source table columns as data fields holding instrument type abbreviations and instrument type descriptions, you must ensure that the values in the source table columns comply with the conventions used in SmartPlant Instrumentation.

After you select the source table columns to be used as the instrument type name (abbreviation) and description, when importing data, the Import Utility creates in SmartPlant Instrumentation new instrument types and instrument type descriptions according to the existing conventions. For example, when importing instrument type abbreviation, all characters exceeding the first six characters are truncated. To carry out a successful import, you need to select the source table columns which are most compatible with the SmartPlant Instrumentation instrument type, instrument type description, and process function conventions.

Use the following table as guidelines when selecting source table columns and setting them as instrument type abbreviation fields and instrument type description fields:

Instrument Type Parameter	SmartPlant Instrumentation Conventions
Abbreviation maximum length	6 characters
Abbreviation typeface	Upper case (for example, FY – not – fy or Fy)
Description maximum length	40 characters

IMPORTANT Both instrument type abbreviation and description are required parameters. A combination of instrument type abbreviation and description must be unique.

See Also

Import Instrument Index (on page 93)

Import Instrument Properties (on page 94)

Enable Creation of Complementary Elements for Instrument Index

Prerequisite

NOTE Make sure that the appropriate instrument type profile definitions exist in target domain.

1. On the **Link Definitions** dialog box, in the **Link** box, type a unique link name.
2. Under **Import method** select one of the following:
 - Select **Module (multiple tables)**, and then, under **Name of module or table**, select **Instrument Index**.
 - Select **Single table**, and then, under **Name of module or table**, select **COMPONENT** or any other instrument index-related table.
3. Complete the import link creation.
4. Open the **Link Properties** dialog box, and click the **General** tab.
5. Under **Create complementary elements**, select check boxes for the elements that you want to create. You can create any of the following elements:
 - A device panel and a cable for an instrument whose instrument type profile includes wiring, and which has the following default elements: panel, cable, and connection type.
 - A document number row and a default revision row (which is initially empty) in the DRAWING table for a specification, process data sheet and calculation sheet.
 - Instrument associations with an existing I/O type, location, and hook-up.

See Also

Import Links (on page 15)

Link Properties (see "Import Link Properties" on page 24)

Set Source Fields as Instrument Type Fields

1. On the **Link Properties** dialog box, click the **Source** tab.
2. Under **Process Function**, click **Define**.
3. If this is the first time you are running the link, on the **Define Instrument Type Fields** dialog box, which opens automatically, do the following:
 - a. From the **Source** pane, drag one or more source table columns to the **Instrument type name** pane. The values in the source column fields become instrument type abbreviation fields after data import.
 - b. From the **Source** pane, drag one or more source table columns to the **Instrument type description** pane. The values in the source column fields become instrument type description fields after data import.

TIPS

- You can use concatenated sources. For details, see *Example of Concatenated Sources* (on page 95).
 - Instrument type abbreviation characters that exceed six characters are truncated. For details about instrument type conventions that exist in SmartPlant Instrumentation, see *Prerequisite for Importing Instrument Types* (on page 90).
4. Click **OK** to close the **Define Instrument Type Fields** dialog box.
 5. On the **Process Function Mapping** dialog box, for each instrument type in the left section, drag the appropriate process function from the right section to either a light-blue field (unassigned process function) or a white field (previously assigned process function) in the **Process function** column next to the appropriate instrument type.

6. To filter the instrument type fields displayed in the left pane, under **Display process function assignments**, do one of the following:

- Select **All** to display assigned and unassigned instrument types.
- Select **Unassigned only** to display only instrument types which are not assigned yet with process functions.
- Select **Assigned only** to display only instrument types which are assigned with process functions.

TIPS

- If you previously imported instrument types using the current link, some of the instrument types are already assigned to process functions and exist in SmartPlant Instrumentation. These instrument types are displayed in a gray background, and you cannot reassign the process functions for them.
 - The **Process Function Mapping** dialog box displays all the source fields that belong to the source table columns you set as instrument type and description columns on the **Define Instrument Type Fields** dialog box.
7. When done, click **OK** to return to the **Source** tab.
 8. On the **Source** tab, under **Process function**, select **Assign**.
 9. Click **OK**.

NOTE When you open the **Import Link** window, the process function macro **@PROC_FUNC_NAME** appears in the **Source Name** column mapped to the **PROC_FUNC_NAME** column. You do not need to define any manual mapping for the process function and instrument type fields. When importing data, the software uses the source fields that you set as the instrument type fields.

See Also

Formulas and Arithmetic Functions in Import Links (on page 66)

Associate Source Fields with Existing Instrument Types

1. On the **Link Properties** dialog box, click the **Source** tab.
2. Under **Process Function**, click **Define**.
3. If this is the first time you are running the link, on the **Define Instrument Type Fields** dialog box, which opens automatically, do the following:
 - a. From the **Source** pane, drag one or more source table columns to the **Instrument type name** pane. The values in the source columns become instrument type abbreviation fields after data import.
 - b. From the **Source** pane, drag one or more source table columns to the **Instrument type description** pane. The values in the source columns become instrument type description fields after data import.

TIPS

- You can use concatenated sources. For details, see *Example of Concatenated Sources* (on page 95).
 - Instrument type abbreviation characters that exceed six characters are truncated. For details about instrument type conventions that exist in SmartPlant Instrumentation, see *Prerequisite for Importing Instrument Types* (on page 90).
4. Click **OK** to close the **Define Instrument Type Fields** dialog box.
 5. On the **Process Function Mapping** dialog box, click **Instrument Type** to open the **Instrument Type Mapping** dialog box.
 6. From the **Instrument types** pane, drag an instrument type to each field displayed in the **Instrument type mapping to source** pane.

7. Click **OK** to return to the **Process Function Mapping** dialog box.
8. On the **Process Function Mapping** dialog box, click **OK**.
9. On the **Source** tab, under **Process function**, select **Assign**.
10. Click **OK**.

NOTE When you open the **Import Link** window, the process function macro **@PROC_FUNC_NAME** appears in the **Source Name** column mapped to the **PROC_FUNC_NAME** column. You do not need to define any manual mapping for the process function and instrument type fields. When importing instrument tags, the software uses the source fields that you set as the instrument type field to automatically associate the tags with the appropriate instrument types.

See Also

Formulas and Arithmetic Functions in Import Links (on page 66)

Import Instrument Index

Prerequisites

- Make sure that the tag numbers or tag number segments in the import source are compatible with the naming convention that is defined in the target <unit> of SmartPlant Instrumentation.
 - Make sure that the import source contains instrument type name, description, and process function definitions. For details about process function codes that exist in SmartPlant Instrumentation, see *Process Function Mapping Codes for Instrument Index Import* (on page 69).
1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Module (multiple tables)**.
 - c. Under **Name of module or table**, select **Instrument Index**.
 - d. Complete the import link creation.
 2. Open the **Link Properties** dialog box, and do the following:
 - a. If you want to import instruments that exist into more than one <unit>, on the **Import Level** tab, under **Hierarchy levels**, select **Apply** and also select the lowest plant hierarchy level. For details, see *Import Data Into Multiple Plant Hierarchy Items* (on page 87).
 - b. If needed, on the **General** tab, enable creation of complementary elements according to instrument type profiles of the source tags. For details, see *Enable Creation of Complementary Elements for Instrument Index* (on page 91).
 - c. On the **General** tab, make sure that **Import to supporting tables** only is cleared. If you select this check box, you cannot import tag numbers using this import link but only supporting table data.
 - d. If you do not want to create any loop numbers, on the **Tag/Loop** tab, clear the **Use loop reference data** check box.
 3. In the **Import Link** window, open the import link.
 4. In the **Target** pane, define the import mapping as follows:
 - a. If you have instruments belonging to more than one tag class, define a mapping value for the **Tag Class (CMPNT_CAT_ID)** column. For details, see *Tag Class Mapping Codes for Instrument Index Import* (on page 68).
 - b. Select the **Tag No** field, and then, from the **Source** pane, drag the column containing the tag numbers.

- c. If you want to import data into instrument index supporting tables, define mapping for the supporting table names (indicated by bold blue font in the **Target** pane), and then map the fields that you need.
- d. Map the process function column **PROC_FUNC_NAME**, instrument type abbreviation column **CMPNT_FUNC_TYPE_NAME** and instrument type description column **CMPNT_FUNC_TYPE_DESC**.

TIP You can set the software to use the **@PROC_FUNC_NAME** macro instead of mapping the process function and instrument type fields. The software runs this macro if you have assigned process functions to instrument type fields using the **Source** tab options of **Link Properties** dialog box. The macro appears in the **Import Link** window mapped automatically to the **PROC_FUNC_NAME** column. For details, see *Set Source Fields as Instrument Type Fields* (on page 91).

5. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.

TIP If you want to import line P&ID drawing references and assign them to the imported tag numbers, you must map the same source **P&ID** column to the following columns in the **Target** pane: **P&ID (DWG_NAME)** and **LineP&ID (DWG_NAME)**. This is because the Import Utility does not support automatic association of line P&ID drawing references with tag numbers.

6. Import the data.

NOTE After importing supporting table data, the imported values appear in SmartPlant Instrumentation in two places: **Tag Number Properties** dialog box and the appropriate supporting table dialog boxes. This is because primary key columns of supporting tables (those with the **_ID** suffix) have reference foreign key columns in the **COMPONENT** table, which holds tag numbers in the **CMPNT_ID** column.

See Also

Defining Import Link Properties Common Tasks (on page 24)
Set Column Display for the Module Import Method (on page 30)
Example of Concatenated Sources (on page 95)
Matching Naming Conventions (on page 81)

Import Instrument Properties

Prerequisite

If you want to import an instrument property and this property is a supporting table value, make sure that this value already exists in the appropriate supporting table in SmartPlant Instrumentation. For example, if you want to assign a **Field** location to a number of instruments, make sure that **Field** is defined in the **Instrument Locations** supporting table. If, however, you want to import a new instrument property and also insert it into a supporting table, you need to use another procedure. For details, see *Import Instrument Index* (on page 93).

1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **COMPONENT**.
 - d. Complete the import link creation.
2. Open the **Link Properties** dialog box, and do the following:
 - a. If you want to import data to instruments that exist in more than one <unit>, on the **Import Level** tab, under **Hierarchy levels**, select **Apply** and also select the lowest plant hierarchy level. For details, see *Import Data Into Multiple Plant Hierarchy Items* (on page 87).

- b. On the **Tag/Loop** tab, clear the **Use loop reference data** check box if you do not want to import loop properties.
 3. In the **Import Link** window, open the import link.
 4. In the **Target** pane, define the import mapping as follows:
 - a. If you have instruments belonging to more than one tag class, define a mapping value for the **Tag Class (CMPNT_CAT_ID)** column. For details, see *Tag Class Mapping Codes for Instrument Index Import* (on page 68).
 - b. Select the **Tag No** field, and then, from the **Source** pane, drag the column containing the tag numbers.
 - c. Define mapping for the instrument properties that you want to insert into the COMPONENT table for the mapped tag numbers.
- TIP** If you want to associate the source tag numbers with lines that exist in SmartPlant Instrumentation, note that the Import Utility does not associate P&ID drawing references of lines with tag numbers automatically. If you want to assign line P&ID drawing references to the source tag numbers, you must define mapping for both **LINE_NUM/LINE_ID** and **DWG_NAME/DWG_ID** columns in the **Target** pane.
5. Import the data.

NOTE After importing supporting table data, the imported values appear as assigned to the appropriate instruments in the **Tag Number Properties** dialog box.

See Also

Defining Import Link Properties Common Tasks (on page 24)

Example of Concatenated Sources

The following example refers to the use of concatenated sources on the **Define Instrument Type Fields** dialog box, where you set source fields as instrument type fields. You can also use concatenated sources in any field in the **Import Link** window, when mapping source and target columns.

Suppose that your data source contains the following columns: **cmpnt_func_type_name** column holding source instrument type names and **cmpnt_func_type_desc** column holding source instrument type descriptions. On the **Define Instrument Type Fields dialog box**, you can move both columns to the **Instrument type description** pane and specify sub-string parameters as follows:

```
cmpn_func + cmpnt_name(2,5)
```

The imported instrument type description is made up of the source instrument type plus five characters of the source description starting from the second character.

Now, suppose that you specify the following concatenated string:

```
cmpn_func + cmpnt_name(2)
```

The imported instrument type description is made up of the source instrument type plus all the characters of the source description starting from the second character.

Creating Specifications by Data Import Common Tasks

The following tasks are used when creating specifications in SmartPlant Instrumentation by importing data from a predefined source.

Create Specs Using the Module Import Method

Use this procedure if you want to create instrument specs based on the same spec form and all of your source instrument tags belong to the same process function as the target spec form. You can also import revisions from the source and create process data sheets. For more information, see *Create Specs Using the Module Import Method* (on page 96).

Create Specs Using the Single Table Import Method

This procedure is useful if you want to create specs based on various spec forms for a specific item type, for example, instrument specs, cable specs, panel specs, and so forth. For more information, see *Create Specs Using the Single Table Import Method* (on page 98).

Create a Multi-Tag Spec by Data Import

Use this procedure if you want to create a multi-tag spec with SEE LIST columns in SmartPlant Instrumentation. For more information, see *Create a Multi-Tag Spec by Data Import* (on page 99).

Create Specs Using the Module Import Method

Prerequisites

- In SmartPlant Instrumentation, create a target spec form with the appropriate process function.
 - Make sure that the instrument tags in your source already exist in SmartPlant Instrumentation.
 - Make sure that all the source tags have the same process function as the target spec form. Tags that do not have the same process function are rejected by the Import Utility and you cannot import data from your source.
1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Module (multiple tables)**.
 - c. Under **Name of module or table**, select **Specifications**.
 - d. Complete the import link creation.
 2. Open the **Link Properties** dialog box, and click the **Specs** tab.
 3. Under **Specifications** module, do the following:
 - a. From the **Specification form** list, select the target spec form.
 - b. Clear **Import to multiple- item specification sheets**.
 4. Under **Specification sheet options**, to define the target spec document numbers, do one of the following:
 - Select **Use custom drawing name** to import spec document numbers from the source. You can then map the **Spec Drawing Name** field in the **Import Link** window.
 - Clear **Use custom drawing name** to set the Import Utility to create specs with default document numbers.
- NOTE** Document numbers in the import source must be unique for each instrument.
5. Select **Include revisions in import** to import spec revisions from the source. You can then map the **Spec Revision No** field in the **Import Link** window.
- NOTE** If you clear this check box, you cannot import any specification revision data using the current import link.

6. Select **Use custom drawing name for process data** to import source document numbers for process data sheets. You can then map the **Process Data Drawing Name** field in the **Import Link** window.

NOTES

- Even if the target spec form does not contain fields from process data tables and you do not import any process data value with the spec, after you map the document numbers for process data sheets and run the import process, the Import Utility creates an empty process data sheet in SmartPlant Instrumentation and associates it with the instrument for which you created the spec.
 - If you clear this check box, if you import any process data value, when creating a spec, the Import Utility also creates a process data sheet and assigns a default document number to the process data sheet.
 - Document numbers in the import source must be unique for each instrument.
7. In the **Import Link** window, open the import link.
 8. In the **Target** pane, define the import mapping as follows:
 - a. If the source tag does not have process data cases, in the **CASE_NAME** field, type "" (or "*" if the database platform is SQL Server).
 - b. Select the **Tag No** field, and then, from the **Source** pane, drag the column containing the tag numbers.
 - c. Depending on the link properties, define mapping for the **Spec Drawing Name**, **Spec Revision No**, and **Process Data Drawing Name** fields.
 - d. If you define mapping process data fields belonging to the **PD_GENERAL** table, map the **Upstream Condition** field, which is actually the **Fluid State** field. For details, see *Fluid State Mapping Codes for Process Data Import* (on page 69).
 9. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
 10. Import the data.

See Also

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Process Function Mapping Codes for Instrument Index Import (on page 69)

Create Specs Using the Single Table Import Method

Prerequisites

- In SmartPlant Instrumentation, create the target spec forms.
- Make sure that the spec form numbers in your source match the target spec forms in SmartPlant Instrumentation.
- Make sure that the items in your source already exist in SmartPlant Instrumentation, for example, instrument, cables, panels, and so forth.
- If you want to create instrument specs, make sure that the process functions of the source tags match the process functions of the target form. Tags that do not have the same process function will be rejected by the Import Utility and you will not be able to perform data import from your source.

CAUTION When creating specs using the **Single table** method, the Import Utility does not validate whether the process function of source tags matches the process function of the target form. Therefore, to prevent database problems in SmartPlant Instrumentation after data import, you must exercise extreme caution when defining tag process functions in the source columns.

1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **SPEC_SHEET_DATA**.
 - d. Complete the import link creation.
2. Open the **Link Properties** dialog box, and then, on the **General** tab, under **Create complementary elements** do one of the following:
 - Select the **Create** check box beside **Drawing & Revision** to create automatically a default document number for each spec and insert a zero revision row for each spec (invisible the SmartPlant Instrumentation interface).
 - Clear the **Create** check box beside **Drawing & Revision** if you want to map the document numbers and revisions from the source or if you do not want to create any document numbers or revisions for specs during the import process.
3. Click the **Specs** tab, and then, from the **Specification item type** list, select the item type for which you want to create specs.
4. In the **Import Link** window, open the import link.
5. In the **Target** pane, define the import mapping as follows:
 - a. If the selected item type is **Instrument** but the source tags do not have process data cases, in the **CASE_NAME/CASE ID** field, type " (or "*" if the database platform is SQL Server).
 - b. Select the item type field (the **Tag Number** field if you want to create instrument specs), and then, from the **Source** pane, drag the column containing the source items.
 - c. Map the **SPEC FORM CNUM/SPEC FORM ID** column to match the source and target form numbers.
 - d. If you want to import document numbers and revisions from the source, map the **DWG NAME/DWG ID** column to import the document numbers from the source and also map the **REV NO/REV ID** column to import the source revisions.
6. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
7. Import the data.

Create a Multi-Tag Spec by Data Import

Prerequisites

- Make sure that the instrument tags that you want to include in a multi-item spec exist in SmartPlant Instrumentation.
 - In SmartPlant Instrumentation, create a target spec form and generate a format with SEE LIST fields.
 - In your import source, define all the instrument tags you want to include in the multi-tag spec. The first tag in your source column becomes the master tag in the created spec. In the same import source, define the target columns and column values.
1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Module (multiple tables)**.
 - c. Under **Name of module or table**, select **Specifications**.
 - d. Complete the import link creation.
 2. Open the **Link Properties** dialog box, and click the **Specs** tab.
 3. From the **Specification item type** list, select **Instrument**.
 4. Under **Specifications** module, do the following:
 - a. From the **Specification form** list, select the target spec form for which you defined a multi-tag list format.
 - b. Select **Import to multiple- item specification sheets**.
 - c. From the **Specification format** list, select the target format.

TIP The **Use custom drawing name** check box is selected automatically because you must define manually one document number for all the instrument tags when mapping the source and target table columns in the **Import Link** window.
 5. In the **Import Link** window, open the import link.
 6. In the **Target** pane, define the import mapping as follows:
 - a. If the source tags do not have process data cases, in the **CASE_NAME** field, type " (or "*" if the database platform is SQL Server).
 - b. Select the **Tag No** field, and then, from the **Source** pane, drag the column containing the tag numbers.
 - c. In the **Spec Drawing Name** field, type one alpha-numeric value for the multi-tag spec document number you want to create.
 7. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
 8. Import the data.

See Also

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Fluid State Mapping Codes for Process Data Import (on page 69)

Importing Revisions

The Import Utility allows you to import revision data into any document that has a document number. Therefore, your import source must contain a column with document numbers that already exist in SmartPlant Instrumentation. When importing data, the Import Utility matches the source and target document numbers and imports the revision data into the appropriate document, be it a calculation or process data sheet, a spec, or any other document for which it is possible to define revisions in SmartPlant Instrumentation.

In the database, revision data is stored in the **REVISION** table columns. There are two types of revision data fields: custom fields (REV_UDF columns) and non-custom (other than REV_UDF). Non-custom fields appear in SmartPlant Instrumentation on the **Revisions** dialog box and in document title block fields. You can import data to any of these fields. Custom fields do not appear in the SmartPlant Instrumentation interface by default. You can add custom fields as additional revision fields when customizing title blocks in InfoMaker. You cannot import data into the REV_UDF fields. The required columns for import mapping are **DWG_NAME** (document number) and **REV_NO** (revision number).

If you assign an import link to the **Single table** import method and select the **REVISION** table, you can import revision data to any SmartPlant Instrumentation document, provided that the target document and the import source have the same document number. If you assign an import link to the **Module (multiple tables)** import method, and select the **Process Data** or **Specifications** module, you need to define revision import options on the **Link Properties** dialog box (**General** tab options for importing process data or calculation sheet revisions, or **Specs** tab for importing specification revisions).

See Also

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Map Source and Target Fields Common Tasks (on page 61)

Import Revisions into the Revision Table

Use this procedure to import revisions to any document in SmartPlant Instrumentation.

IMPORTANT The following are prerequisites before importing revisions into the Revisions table:

- Make sure that the documents for which you want to import revisions already exist in SmartPlant Instrumentation.
 - Make sure that the document numbers are defined both in the import source and in the target documents.
1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **REVISION**.
 - d. Complete the import link creation.
 2. On the **Link Properties** dialog box, define the import link properties as you require.
 3. In the **Import Link** window, open the import link.
 4. In the **Target** pane, define the import mapping as follows:
 - a. Select the **DWG NAME/DWG ID** field, and then, from the **Source** pane, drag the column containing the source document numbers.
 - b. Select the **REV NO** field, and then, from the **Source** pane, drag the column containing the source revision numbers.
 5. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.

TIP You cannot import data into the REV UDF fields. These fields are custom fields that you can add as additional revision fields when customizing title blocks in InfoMaker. You can import revision values to any non-custom fields (other than REV UDF). The display names of these fields are shown on the **Revisions** dialog box in SmartPlant Instrumentation.

6. Import the data.

See Also

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Map Source and Target Fields Common Tasks (on page 61)

Import Process Data and Calculation Sheet Revisions

Use this procedure if you only want to import process data revisions. You can also set the software to create a calculation sheet and import calculation sheet revisions when importing process data revisions.

IMPORTANT Before importing process data and calculation sheet revision, make sure that the tag numbers for which you want to import process data or calculation sheet revisions already exist in SmartPlant Instrumentation.

1. On the **Link Definitions** dialog box, create an import link as follows:
 - a. In the **Link** box, type a unique link name.
 - b. Under **Import method**, select **Module (multiple tables)**.
 - c. Under **Name of module or table**, select **Process Data**.
 - d. Complete the import link creation.
2. On the **General** tab of the **Link Properties** dialog box, select a combination of the following check boxes: **Import revisions**, **Use custom drawing names**, and **Create calculation sheet**. Use the following table as a guide to the check box selection combinations you can use and the data for which you need to define the links:

Data to Link	Import revisions	Use custom drawing names	Create calculation sheet
Process data revisions	Select	Clear	Clear
Process data sheet document numbers	Clear	Select	Clear
Process data sheet document numbers and revisions	Select	Select	Clear
Calculation data	Clear	Clear	Select
Calculation and process data sheet revisions	Select	Clear	Select
Calculation and process data sheet document numbers	Clear	Select	Select
Calculation and process data sheet document numbers and revisions	Select	Select	Select

3. Define other properties for the link as you require.
4. In the **Import Link** window, open the import link.
5. In the **Target** pane, define the import mapping as follows:

- a. Map the **Tag Number** and **Case Name** fields by dragging the appropriate column names from the **Source** pane.
 - b. Map the appropriate revision and document number (drawing name) fields by dragging the appropriate column names from the **Source** pane.
- NOTE** If the source tags do not have process data cases, in the **Case Name** field, type " (or '*' if the database platform is SQL Server).
6. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
 7. Import the data.

Importing Wiring Data

You can use the Import Utility to create wiring data in SmartPlant Instrumentation. Wiring data import includes wiring items such as panels, cable, wires, and so forth, and also includes various wiring connections, signal propagation, and I/O assignments. In the SmartPlant Instrumentation database, wiring data is defined at a <plant> level. This means that you do not have to specify the import level when defining import link properties because the default import level is <plant>. In the SmartPlant Instrumentation **Domain Explorer**, wiring items that you import appear in the appropriate wiring item category folders displayed at a <plant> level. It is possible, however, to import wiring items at a <unit> level if needed. For example, if you want device panels and device cables to appear in the <unit> to which the associated instrument tags belong, you need to import the device panels and device cables items at a <unit> level. In the **Domain Explorer**, you can then filter the imported panels and cables per <unit>.

SmartPlant Instrumentation allows you to use non-unique wiring item names. This is, however, not possible in the Import Utility because the default table definitions used in import links require name uniqueness. If you are an advanced user, you can define a new table definition to enable the software to import items with non-unique names.

SmartPlant Instrumentation allows you to import complex wiring item hierarchies.

If you imported data incorrectly into your <plant>, you might have to delete your plant or spend a lot of time fining the problems manually. Since wiring data import involves data insertion into so many tables and because wiring data import links are likely to be complex due to a large number of mapped columns in various tables, we recommend that you create a special domain where you can check the import results. After you are satisfied with the results, you can export the import links and then import them into the domain into which you want import wiring data. For details, see *Moving Links Between Databases or Domains* (on page 16).

You can either import wiring data using the **Single table** import method or **Single table** import method + reference tables. Selecting the method for wiring data import largely depends on your import source. If your import source includes several files with wiring item definitions, for each file, you can create an individual single-table import link as you require. Single-table links are easy to manage and troubleshoot. If your import source is complex and contains, for example, panels with corresponding cables for each panel, you can include reference tables into the link.

A link whose properties include data insertion into reference tables allows you to import wiring data into a specific table that you selected when creating the link and also import data into any related table depending on your import source. Note, however, that such a link opens more slowly than a single-table link due to a large number of reference tables that a given wiring table has. Also, when running such a link, you are more likely to come across various errors due to the mapping complexity. Troubleshooting these errors may be time consuming. In any case, before importing wiring data, familiarize yourself with the structure of wiring items in the SmartPlant Instrumentation Demonstration database (IN_DEMO.db).

You can actually import most of your wiring data by running just three complex links created for the following tables: PANEL_STRIP_TERM, WIRE, and WIRE_TERMINAL. When importing data into the PANEL_STRIP_TERM table and its reference tables, you can import all related panel

information such as panels, terminal strips, terminals, and so forth. When importing data into the WIRE table and its reference tables, you can import all the related cable information such as cable sets, wires, wire colors, and so forth. When importing data into the WIRE_TERMINAL table and its reference tables, you can import all the connections between panels and cables. You can create a link group with these links and import all your panels, cables and connections in batch mode.

NOTE The Wiring module is unavailable for assigning to an import link.

Importing Wiring Data Common Tasks

The following tasks are used when importing instrument tags and loops.

Import Cables, Cable Sets, and Wires

Use this procedure to import cables and their child items. The hierarchy of cables and their child items is rigid: cables, cable sets, and wires. Depending on the DEF_FLG flag mapping in the **Import Link** window, in SmartPlant Instrumentation, imported cables appear either in the **Reference Explorer** as reference cables, or in the **Domain Explorer** as actual <plant> cables or <plant> cross cables. You can import cables and their child items in one of the following ways:

- Defining one import link for the WIRE table and enabling the software to insert data into the reference tables
- Defining individual import links for the CABLE, CABLE_SET, and WIRE tables and then running them in the following order: cables, cable sets, wires.

For more information, see *Import Cables, Cable Sets, and Wires* (on page 110).

Import Panels

Use this procedure to import panels. In the SmartPlant Instrumentation database, all panels, regardless of the panel category, are stored in the PANEL table; therefore, to distinguish between various panel categories, in the **Import Link** window, you must specify correct mapping for the panel category you want to import and also map the panel sub- category. Note that wiring equipment is stored in the APPARATUS table, whereas, apparatuses appear in the CHANNEL table. Table names of other panel constituents are easy to recognize because they include the actual item names in SmartPlant Instrumentation; for example, columns of the PANEL_STRIP_TERM table hold all terminals. For more information, see *Import Panels* (on page 104).

Import Device Panels as Cabinet Child Items

This scenario enables you to import device panels so that they appear under cabinets in the **Domain Explorer** in SmartPlant Instrumentation. In this scenario, you must create a new table definition and add an appropriate foreign key for the PANEL table. If you are an advanced user having in- depth knowledge of the SmartPlant Instrumentation database, you can use this scenario as a basis for importing panels and their constituents in any way you need. For more information, see *Import Device Panels as Cabinet Child Items* (on page 106).

Import Terminal Strips and Terminals

Use this procedure to import terminal strips and terminals. In the SmartPlant Instrumentation database, the PANEL_STRIP table holds terminal strips and the PANEL_STRIP_TERM table holds terminals. For more information, see *Import Terminal Strips and Terminals* (on page 109).

Import Wiring Equipment

Use this procedure to import wiring equipment. In the SmartPlant Instrumentation database, wiring equipment appears in the APPARATUS table. Note, however, that apparatuses appear in the CHANNEL table. For more information, see *Import Terminal Strips and Terminals* (on page 109).

Import Cables, Cable Sets, and Wires

Use this procedure to import cables and their child items. The hierarchy of cables and their child items is rigid: cables, cable sets, and wires. Depending on the DEF_FLG flag mapping in the **Import Link** window, in SmartPlant Instrumentation, imported cables appear either in the **Reference Explorer** as reference cables, or in the **Domain Explorer** as actual <plant> cables or <plant> cross cables. You can import cables and their child items in one of the following ways:

- Defining one import link for the WIRE table and enabling the software to insert data into the reference tables
- Defining individual import links for the CABLE, CABLE_SET, and WIRE tables and then running them in the following order: cables, cable sets, wires.

For more information, see *Import Cables, Cable Sets, and Wires* (on page 110).

Import Wiring Connection Data

Use this procedure to import wiring connections with or without signal propagation. For more information, see *Import Wiring Connection Data* (on page 111).

Import Panels

1. Create a link group for placing the link you are going to create and also links defined for panel constituents, for example, wiring equipment, terminal strips, and terminals.
2. On the **Link Definitions** dialog box, create an import link for panels as follows:
 - a. In the **Link** box, type a unique link name, for example **Panels**.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **PANEL**.
 - d. Complete the import link creation.
3. Open the **Link Properties** dialog box, and, on the **General** tab, do the following:
 - a. Make sure that **Import to supporting tables** is cleared.
 - b. Under **Undefined NOT NULL fields**, select **Reject rows**.

TIP Selecting **Reject rows** is recommended to set the software to reject all source values that do not match foreign key values in the PANEL table. For example, if a panel manufacturer in your source does not match the manufacturer that already exists in SmartPlant Instrumentation, the software indicates that this manufacturer does not exist. If you select the **Use default value**, in the PANEL table, the Import Utility will enter 0 (zero) values in all the columns whose values do not match the values in the import source.

4. If your import source contains device panels, and you need to associate them with instruments that exist in various <units> in SmartPlant Instrumentation, on the **Import Level** tab, under **Hierarchy levels**, select **Apply** and also select the lowest plant hierarchy level. For details, see *Import Data Into Multiple Plant Hierarchy Items* (on page 87).

TIPS

- If your import source contains device panels, we recommend that the target <unit> for importing device panels be the same as the <unit> where the associated instrument tags appear.

- Although, <plant> is the default import level for wiring data, specifying a <unit> level for wiring items allows you to filter the imported wiring data per <unit> in the **Domain Explorer**.
5. In the **Import Link** window, open the import link.
 6. In the **Target** pane, define the import mapping as follows:
 - a. Click the **PANEL_NAME** row, and then, from the **Source** pane, drag the column containing the panel names.
 - b. Depending on your source panel type, define a mapping value for the **PANEL_CATEGORY** and **PANEL_SUB_CATEGORY** columns. For details, see *Mapping Codes for Wiring Data Import* (on page 70).
 - c. For the **DEF_FLG** flag, enter **N** so that the in SmartPlant Instrumentation, the imported panels appear in the **Domain Explorer**.
 - d. If you need to specify a panel location, for the **PANEL_LOC_NAME/PANEL_LOC_ID** column, enter the target location, for example, **Building+'/' +Room**

TIPS

In SmartPlant Instrumentation, the imported panel location hierarchy appears in the folder **Panels by Location**.

If you define **Y** as a mapping value for the **DEF_FLG** flag, in SmartPlant Instrumentation, the imported items appear in the **Reference Explorer**.

7. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
8. In the link group containing links defined for panels and their constituent items, prioritize the links so that the **Panels** link has the highest priority. For details, see *Prioritize Links in a Link Group* (on page 13).
9. Run the links in this order.

NOTE If you must create a single link for importing panels and their child items, you need to select **PANEL_STRIP_TERM** as the target table and also select **Insert data into reference tables** check box on the **Link Properties** dialog box. Bear in mind that such a link opens more slowly than a single-table link due to a large number of reference tables that the **PANEL_STRIP_TERM** table has. Also, when running such a link, you are more likely to come across various errors due to the mapping complexity. Troubleshooting these errors may be time consuming.

Import Device Panels as Cabinet Child Items

IMPORTANT The following are prerequisites before importing device panels as cabinet child items:

- Make sure you first import or create all the target cabinets.
 - Make sure that your import source contains the device panels that you want to import and the cabinets under which you want the device panels to appear in SmartPlant Instrumentation.
1. On the **Link Definitions** dialog box, create an import link for panels as follows:
 - a. In the **Link** box, type a unique link name, for example **Device Panels Within Cabinets**.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **Panel**.
 - d. Complete the import link creation.
 2. Open the **Link Properties** dialog box, and, on the **General** tab, do the following:
 - a. Make sure that **Import to supporting tables** is cleared.
 - b. Under **Undefined NOT NULL fields**, select **Reject rows**.

TIP Selecting **Reject rows** is recommended to set the software to reject all source values that do not match foreign key values in the PANEL table. For example, if a cabinet model in your source does not match the model that already exists in SmartPlant Instrumentation, the software indicates that this model does not exist. If you select the **Use default value**, in the PANEL table, the Import Utility will enter 0 (zero) values in all the columns whose values do not match the values in the import source.
 3. Since your import source contains device panels, you will need to associate them with instruments that exist in various <units> in SmartPlant Instrumentation. Therefore, on the **Import Level** tab, under **Hierarchy levels**, select **Apply** and also select the lowest plant hierarchy level. For details, see *Import Data Into Multiple Plant Hierarchy Items* (on page 87).

TIPS

- For an import source that contains device panels, we recommend that the target <unit> for importing device panels be the same as the <unit> where the associated instrument tags appear.
 - Although, <plant> is the default import level for wiring data, specifying a <unit> level for wiring items allows you to filter the imported wiring data per <unit> in the **Domain Explorer**.
4. Click **Table Definition** and create a new table definition on the basis of the **Default** definition. For details, see *Create a Table Definition on the Basis of Another Definition* (on page 48).
 5. To create a new key definition, do the following:
 - a. Select **Foreign Key** and close the **Foreign Key List** pop-up window.
 - b. Click **Clear** to clear the **Key definition** working area and then, from the **Column definition** pane, drag the **PARENT_ID** column to the **Key definition** working area.

- c. Add the following key definition:

The screenshot shows the 'Import Utility' window with three main panes:

- Table List:** A list of tables including PANEL, PANEL_COMPONENT, PANEL_FROM_VIEW, PANEL_LEFT_VIEW, PANEL_LOCATION, PANEL_MFR, PANEL_MFR_MOD, PANEL_RIGHT_VIEW, and PANEL_STRIP. The 'PANEL' table is selected.
- Column Definition:** A table showing columns for the selected table. The columns are: Column Name, Type, Reference Table, Visible, and De. The rows are: PANEL ID (numbe), PANEL NOTE (char), CELL (char), PARENT ID (numbe), PANEL TRANS NAM (char), and FREQUENCY ID (numbe). The 'PARENT ID' row is highlighted.
- Key Definition:** A table showing key definitions. The columns are: Key Name, Reference Table, Reference Column, Reference Key, and Local. The row for 'PARENT_ID' is highlighted, showing it references the 'PANEL' table, 'PANEL_NAME' column, and 'PANEL_ID' key.

At the bottom of the 'Key Definition' pane, there are radio buttons for 'Primary key' and 'Foreign key' (selected), and a checkbox for 'Define parameters for Level Key'. There are also 'Clear', 'Delete Key', and 'Apply' buttons.

- d. In the **Column definition** pane, scroll right to display the **Key Level** column.
e. Manually remove all the key levels from the **PARENT_ID** column.
f. Save the new definition.

TIP Adding the PARENT_ID foreign key into the PANEL table enables you to define cabinets as parent items of device panes in the same table. The new key definition allows the Import Utility to find cabinet names in the PANEL_NAME column of the PANEL table and write the matching PANEL_ID column values into the PARENT_ID column.

6. In the **Import Link** window, open the import link.
7. In the **Target** pane, define the import mapping as follows:
 - Click the **PANEL_NAME** row, and then, from the **Source** pane, drag the column containing the source device panel names.
 - Click the **PARENT_ID** row, and then, from the **Source** pane, drag the column containing the cabinets within which you want the device panels to appear.
 - For the **PANEL_CATEGORY** column, type **4** as the mapping value.
 - For the **PANEL_SUB_CATEGORY** column, type **410** as the mapping value. For details of various panel category mapping values, see *Mapping Codes for Wiring Data Import* (on page 70).
 - For the **DEF_FLG** flag, enter **N** so that the in SmartPlant Instrumentation, the imported panels appear in the **Domain Explorer**.
- TIP** If you define **Y** as a mapping value for the **DEF_FLG** flag, in SmartPlant Instrumentation, the imported items appear in the **Reference Explorer**.
8. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
9. Run the import link.

Import Wiring Equipment

IMPORTANT Before importing wiring equipment, make sure you first import or create all the target panels. In SmartPlant Instrumentation, wiring equipment is a child item of a panel.

1. Create a link group for placing the link you are going to create and also links defined for panels and their constituents, such as terminal strips and terminals.
2. On the **Link Definitions** dialog box, create an import link for panels as follows:
 - a. In the **Link** box, type a unique link name, for example **Wiring Equipment**.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **APPARATUS**.
 - d. Complete the import link creation.
3. Open the **Link Properties** dialog box, and, on the **General** tab, do the following:
 - a. Make sure that **Import to supporting tables** is cleared.
 - b. Under **Undefined NOT NULL fields**, select **Reject rows**.

TIP Selecting **Reject rows** is recommended to set the software to reject all source values that do not match foreign key values in the APPARATUS table. For example, if a wiring equipment model in your source does not match the model that already exists in SmartPlant Instrumentation, the software indicates that this model does not exist. If you select the **Use default value**, in the APPARATUS table, the Import Utility will enter 0 (zero) values in all the columns whose values do not match the values in the import source.

4. On the **Link Properties** dialog box, click **Table Definition** and do the following:
 - a. On the **Table Definition** dialog box, click **Definition**.
 - b. On the **Table Definition Name** dialog box, select the definition that you require.

TIP If you do not find the definition that you require, you can create a new definition on the basis of the **Default** definition. For details, see *Create a Table Definition on the Basis of Another Definition* (on page 48).

5. In the **Import Link** window, open the import link.
6. In the **Target** pane, define the import mapping as follows:
 - a. Click the **APPAR_NAME** row, and then, from the **Source** pane, drag the column containing the wiring equipment names.
 - b. Depending on your table definition, map the remaining required columns marked in red bold.
 - c. Depending on your source wiring equipment type, define a mapping value for the **CATEGORY NAME/APPAR_CAT_ID** column. For details, see *Mapping Codes for Wiring Data Import* (on page 70).
 - d. For the **DEF_FLG** flag, enter **N** so that the in SmartPlant Instrumentation, the imported panels appear in the **Domain Explorer**.

TIP If you define **Y** as a mapping value for the **DEF_FLG** flag, in SmartPlant Instrumentation, the imported items appear in the **Reference Explorer**.

7. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
8. If you have not imported panels yet, do the following:
 - a. Add the created **Wiring Equipment** link into the group containing the link defined for importing panels.
 - b. Prioritize the links so the **Wiring Equipment** link appears under the links defined for panels. For details, see *Prioritize Links in a Link Group* (on page 13).
 - c. Run the links in this order.

See Also

Create a Link Group (on page 11)

Defining Import Link Properties Common Tasks (on page 24)

Mapping Codes for Wiring Data Import (on page 70)

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Import Terminal Strips and Terminals

IMPORTANT Before importing terminal strips and terminals, make sure you first import or create all the target panels.

1. On the **Link Definitions** dialog box, create an import link for panels as follows:
 - a. In the **Link** box, type a unique link name, for example **Terminal Strips**.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **PANEL_STRIP**.
 - d. Complete the import link creation.
2. Open the **Link Properties** dialog box, and, on the **General** tab, do the following:
 - a. Make sure that **Import to supporting tables** is cleared.
 - b. Under **Undefined NOT NULL fields**, select **Reject rows**.

TIP Selecting **Reject rows** is recommended to set the software to reject all source values that do not match foreign key values in the PANEL_STRIP table. For example, if a panel strip manufacturer in your source does not match the manufacturer that already exists in SmartPlant Instrumentation, the software indicates that this manufacturer does not exist. If you select the **Use default value**, in the PANEL_STRIP table, the Import Utility will enter 0 (zero) values in all the columns whose values do not match the values in the import source.

3. On the **Link Properties** dialog box, click **Table Definition** and do the following:
 - a. On the **Table Definition** dialog box, click **Definition**.
 - b. On the **Table Definition Name** dialog box, select the definition that you require.

TIPS

- The Default definition is only suitable for importing terminal strips of DCS or PLC panels.
- If you want to import terminal strips that do not have names, select the **Panel Strip (by seq)** definition.
- If you want to import terminal strips of junction boxes, cabinets, device panels, or marshaling racks, select the **Panel-Strip** definition.
- If you want to import terminal strips of wiring equipment, select the **Panel-Apparatus-Strip** definition, or a more complex definition, depending on the hierarchy of your wiring items.
- If you do not find the definition that you require, you can create a new definition on the basis of the **Default** definition. For details, see *Create a Table Definition on the Basis of Another Definition* (on page 48).

4. In the **Import Link** window, open the import link.
5. In the **Target** pane, define the import mapping as follows:
 - a. Click the **STRIP_NAME** row, and then, from the **Source** pane, drag the column containing the terminal strip names.
 - b. Depending on your table definition, map the remaining required columns marked in red bold.
 - c. Define a mapping value for the **STRIP_CATEGORY** column. For details, see *Mapping Codes for Wiring Data Import* (on page 70).

- d. For the **DEF_FLG** flag, enter **N** so that the in SmartPlant Instrumentation, the imported panels appear in the Domain Explorer.

TIP If you define **Y** as a mapping value for the **DEF_FLG** flag, in SmartPlant Instrumentation, the imported items appear in the Reference Explorer.

6. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
7. Repeat Steps 1-7 for creating a **Terminals** link for wires by selecting **PANEL_STRIP_TERM** as the target table and make sure you map all the required columns.
8. If you have not imported panels and wiring equipment yet, do the following:
 - a. Add the created links into the group containing links defined for panels and their constituent items.
 - b. Prioritize the links so that the Terminal Strips link appears under the links defined for panels and wiring equipment and the Terminals link appears under Terminal Strips. For details, see *Prioritize Links in a Link Group*.
 - c. Run the links in this order.

NOTE If you must create a single link for importing panels and their child items, you need to select **PANEL_STRIP_TERM** as the target table and also select **Insert data into reference tables** check box on the **Link Properties** dialog box. Bear in mind that such a link opens more slowly than a single-table link due to a large number of reference tables that the **PANEL_STRIP_TERM** table has. Also, when running such a link, you are more likely to come across various errors due to the mapping complexity. Troubleshooting these errors may be time consuming.

Import Cables, Cable Sets, and Wires

1. Create a link group for placing the links you are going to create.
2. On the **Link Definitions** dialog box, create an import link for cables as follows:
 - a. In the **Link** box, type a unique link name, for example **Cables**.
 - b. Under **Import method**, select **Single table**.
 - c. Under **Name of module or table**, select **CABLE**.
 - d. Complete the import link creation.
3. Open the **Link Properties** dialog box, and, on the **General** tab, do the following:
 - a. Make sure that **Import to supporting tables** is cleared.
 - b. Under **Undefined NOT NULL fields**, select **Reject rows**.

TIP Selecting **Reject rows** is recommended to set the software to reject all source values that do not match foreign key values in the CABLE table. For example, if a cable manufacturer in your source does not match the manufacturer that already exists in SmartPlant Instrumentation, the software indicates that this manufacturer does not exist. If you select the **Use default value**, in the CABLE table, the Import Utility will enter 0 (zero) values in all the columns whose values do not match the values in the import source.

4. If your import source contains device cables, and you need to associate them with instruments that exist in various <units> in SmartPlant Instrumentation, on the **Import Level** tab, under **Hierarchy levels**, select **Apply** and also select the lowest plant hierarchy level. For details, see *Import Data Into Multiple Plant Hierarchy Items* (on page 87).

TIPS

- If your import source contains device cables, we recommend that the target <unit> for importing device cables be the same as the <unit> where the associated instrument tags appear.

- Although, <plant> is the default import level for wiring data, specifying a <unit> level for wiring items allows you to filter the imported wiring data per <unit> in the **Domain Explorer**.
5. In the **Import Link** window, open the import link.
 6. In the **Target** pane, define the import mapping as follows:
 - a. Click the **CABLE_NUM** row, and then, from the **Source** pane, drag the column containing the cable names.
 - b. Depending on your source cable type, define a mapping value for the **CABLE_CATEGORY** column. For details, see *Mapping Codes for Wiring Data Import* (on page 70).
 7. To determine whether to create imported items as cables or cross cables do one of the following:
 - For the **DEF_FLG** flag, enter **N** so that the in SmartPlant Instrumentation, the imported cables appear in the **Domain Explorer** in the **Cables** folder.
 - For the **DEF_FLG** flag, enter **C** so that the in SmartPlant Instrumentation, the imported cables appear in the **Domain Explorer** in the **Cross Cables** folder.

TIP If you define **Y** as a mapping value for the **DEF_FLG** flag, in SmartPlant Instrumentation, the imported items appear in the **Reference Explorer**.
 8. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
 9. Repeat Steps 1-8 for creating a **Cable Sets** link for cable sets by selecting **CABLE_SET** as the target table and make sure you map all the required columns, which are shown in red bold.
 10. Repeat Steps 1-8 for creating a **Wires** link for wires by selecting **WIRE** as the target table and make sure you map all the required columns.
 11. In the link group, prioritize the links so that the **Cables** link appears at the top, **Cable Sets** in the middle and **Wires** at the bottom. For details, see *Prioritize Links in a Link Group* (on page 13).
 12. Run the links in this order.

NOTE If you must create a single link for importing cables and their child items, you need to select **WIRE** as the target table and also select **Insert data into reference tables** check box on the **Link Properties** dialog box. Bear in mind that such a link opens more slowly than a single-table link due to a large number of reference tables that the **WIRE** table has. Also, when running such a link, you are more likely to come across various errors due to the mapping complexity. Troubleshooting these errors may be time consuming.

See Also

Create a Link Group (on page 11)

Defining Import Link Properties Common Tasks (on page 24)

Mapping Codes for Wiring Data Import (on page 70)

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

Import Wiring Connection Data

IMPORTANT Before importing wiring data, make sure you first import or create all the target cables, cable sets, and wires, panels, terminal strips, and terminals. In SmartPlant Instrumentation, only terminal strips have terminals and you can only make wiring connections by connecting wires to terminals.

1. On the **Link Definitions** dialog box, create an import link for cables as follows:
 - a. In the **Link** box, type a unique link name, for example **Connections**.
 - b. Under **Import method**, select **Single table**.

- c. Under **Name of module or table**, select **WIRE_TERMINAL**.
 - d. Complete the import link creation.
2. Open the **Link Properties** dialog box, and do the following:
 - a. On the **General** tab, make sure that **Import to supporting tables** is cleared.
 - b. Under **Create complementary elements**, select a check box beside **Wire_group** if you want the software to propagate existing signals automatically.
 - c. Click **Table Definition** and create a new definition in accordance with the definition you specified when creating a link the PANEL_STRIP table. For details, see *Modify a Table Definition* (on page 49).

NOTE The **Default** column definition for the WIRE_TERMINAL table only allows you to connect terminals of strips that appear directly under panels, for example, under DCS or PLC panels. The **Default** definition is not suitable for importing connection data for any other panel type or wiring equipment because it does not contain any primary key from the APPARATUS table for mapping in the **Import Link** window. Since terminal strips that belong to wiring equipment may not have unique names under the same panel, the new column definition for WIRE_TERMINAL table must also include a primary key from the APPARATUS table.

3. In the **Import Link** window, open the import link.
4. In the **Target** pane, map the following required columns:
 - **CABLE_NUM/CABLE_ID** — Target cable
 - **CABLE_SET_NAME/CABLE_SET_ID** — Target cable set
 - **PANEL_NAME/PANEL_ID** — Target panel
 - **SET_LEVEL/WIRE_ID** — Target wire level
 - **STRIP_NAME/STRIP_ID** — Target terminal strip
 - **TERM_SEQ/TERM_ID** — Target terminal sequence number

TIP The list of the required columns appear in the **Default** table definition. If you assigned a new table column definition to the WIRE_TERMINAL table, map the other required columns as appropriate.

5. If you did not include automatic signal propagation in the link properties, you can import signals manually by map the following columns:
 - **GROUP_NAME/WIRE_GROUP_ID** — Signal name
 - **GROUP_SEQ** — Signal sequence
 - **WIRE_GRP_LEVEL** — Signal level

CAUTION You can propagate signals either when a wire on one side of the target cable already carries a signal in SmartPlant Instrumentation or when the target terminal already has a signal, as in a device panel created according to an instrument type profile.

6. If needed, complete the import mapping by dragging the appropriate column names from the **Source** pane or by entering strings or values in the fields in the **Target** pane.
7. Run the link.

TIP If you still need to import your wiring items such as panels, cables, and so forth, and want to group the current **Connections** link together with the other single-table links defined for wiring data import, make sure that the **Connections link** has the lowest priority in the group. For details, see *Prioritize Links in a Link Group* (on page 13).

See Also

Defining Import Link Properties Common Tasks (on page 24)

Mapping Codes for Wiring Data Import (on page 70)

Flow of Activities for Importing Data into SmartPlant Instrumentation (on page 8)

SECTION 2

Import Utility Supplementary Information Tables

The following section contains supplementary information tables for the Import utility.

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Common Error Messages

This table describes some of the most common error messages which appear in both the Import Report and the log file after an import process takes place. Also included in this table are possible causes and suggested solutions for each case.

Message	Possible Cause	Suggested Solution
Empty Component Number of Tag Number	The loop identifier segment of the imported tag is empty.	Modify the source data. Modify the import naming conventions.
Empty Loop Number of Loop Number	The loop identifier segment of the imported loop is empty.	Modify the source data. Modify the import naming conventions.
Illegal Instrument Type of Tag Number	The instrument type you want to import does not exist in the target domain (see Note 1 below).	Modify the source data. Import instrument type data into the COMPONENT_FUNCTION_TYPE table first. Clear the Validate tag and loop segments check box (see Note 3 below).
Illegal Equipment Name of Tag Number	The imported tag equipment name does not exist in the target domain (see Note 1 below).	Modify the source data. Import data into the EQUIPMENT table first (see Note 3 below).
Illegal Equipment Name of Loop Number	The imported loop equipment name does not exist in the target domain (see Note 1 below).	Modify the source data. Import data into the EQUIPMENT table first (see Note 3 below).
Illegal Loop Function of Loop Number	The imported loop function segment value does not exist in the target domain.	Modify the source data. Import loop function data into the LOOP_PROC table first (see Note 3 below).
Illegal Measured Variable of Loop Number	The imported loop measured variable segment value does not exist in the target domain.	Modify the source data. Import loop function data into the LOOP_PROC table first (see Note 3 below).

Message	Possible Cause	Suggested Solution
Illegal <Unit> Number in Tag Number	The imported <unit> number is different from the target <unit> number (see Notes 1, 2 below).	When importing more than one plant hierarchy item, make sure that you have specified the data import level and selected Apply on the Import Level tab of the Link Properties dialog box. Modify the source data. Modify the import naming conventions.
Illegal <Unit> Name in Tag Number	The imported <unit> name is different than the target <unit> name (see Notes 1, 2 below).	When importing more than one plant hierarchy item, make sure that you have specified the data import level and selected Apply on the Import Level tab of the Link Properties dialog box. Modify the source data. Modify the import naming conventions.
Illegal Area Number in Tag Number	The imported area number is different than the target area number (see Notes 1, 2 below).	When importing more than one plant hierarchy item, make sure that you have specified the data import level and selected Apply on the Import Level tab of the Link Properties dialog box. Modify the source data. Modify the import naming conventions.
Illegal Plant Number in Tag Number	The imported plant number is different than the target plant number (see Notes 1, 2 below).	When importing more than one plant, make sure that you have specified the data import level and selected Apply on the Import Level tab of the Link Properties dialog box. Modify the source data. Modify the import naming conventions.
The Process Function is not found	The imported process function name is different than the target (note that this variable is case sensitive and that this value is usually capitalized). The process function name in the COMPONENT or COMPONENT_FUNCTION_TYPE table is different than the process function name value in the PROCESS_FUNCTION table (see Note 1 below).	Modify the import source and define correct mapping codes for instrument process function assignment. For details, see <i>Process Function Mapping Codes for Instrument Index Import</i> (on page 69).
The Instrument Type is	In the COMPONENT table, the	Modify the link settings or the source

Message	Possible Cause	Suggested Solution
not found	CMPNT_FUNC_TYPE_ID column value contains an invalid reference to the COMPONENT_FUNCTION_TYPE table.	data, or clear the Validate tag and loop segments check box.
The Instrument Type does not match the Tag Number	In the COMPONENT table, the instrument type value in the COMPONENT_NAME column (tag number) is different than the value in the CMPNT_FUNC_TYPE_ID column.	Modify the link settings or the source data, or clear the Validate tag and loop segments check box.
The Instrument Type does not match the Process Function	The process function of the tag number does not comply with the process function type, for example, Flow, Temperature, and so forth.	Modify the link settings or the source data, or clear the Validate tag and loop segments check box.
User has selected to reject row on data mismatch	The Import Utility rejected a mismatched source row (see Note 4 below).	Modify the link properties on the Import Mode tab of the Link Properties dialog box.
User has selected to disallow overwrite	The Import Utility has rejected a source row which is identical to an existing target row (see Note 4 below).	Modify the link properties on the Import Mode tab of the Link Properties dialog box.
User has selected to disallow insertion	The Import Utility rejected a source new row (for example, the Import Utility is only updating the target data) (see Note 5 below).	Modify the link properties on the Import Mode tab of the Link Properties dialog box.
Unique value not found	The imported table primary key value does not match the primary key value in the table from which it is derived (see Note 6 below).	Make sure the table which provides the value for the primary key is selected for import.
This is not a numeric value	An attempt has been made to import a non-numeric field to a numeric field.	Make sure you selected the appropriate links in the Link Explorer .
Invalid data	Inappropriate symbols were used in one or more imported fields. An incorrect comparison criteria was applied in the current import process (see Note 7 below).	Select the Use reserved symbols with import on the General tab of the Link Properties dialog box. Make sure you have correct comparison criteria settings. See <i>Target Table Definition</i> (on page 43) for more information about this option.
Data is empty	The Import Utility has imported a Zero-ID row (see Note 8 below).	This message does not indicate an error.

NOTES

The following notes apply to this table:

1. This message is specific for the case in which you select the **Validate tag and loop segments** check box on the **Tag/Loop** tab of the **Link Properties** dialog box. See *Set the Tag/Loop Parameters* (on page 29) for more information.
2. By default, the target <unit> is the one you selected when you started the current import session. If you selected during the import setup process to import data into additional <units>, the target <unit> would be any of these <units> which data will be imported into during the import process. See *Importing Data into Multiple Plant Hierarchy Items or Projects* (on page 86) for further information about importing data into additional target <units>.
3. As a rule of thumb, always import data into reference tables before importing data into the tables they refer to. When importing data using the **Module (multiple tables)** import method, make sure that all appropriate reference tables have been selected for import. The corresponding message in the table varies according to the relevant reference table.
4. This message is typical for the case in which you select the **Insert** option on the **Import Mode** tab of the **Link Properties** dialog box.
5. This message is typical for the case in which you select the **Reject rows** on the **General** tab of the **Link Properties** dialog box. See *Set Properties for Handling Mismatched Data* (on page 26) to learn how to handle mismatched data.
6. This message is typical for the case in which you import a table whose primary key is derived from another table's primary key. In this case the table the primary key belongs to must also be imported. For example, the **PD_GENERAL** table primary key, **CMPNT_ID**, is derived from the **COMPONENT** table. Therefore, the **PD_GENERAL** table primary key value must exist in the **COMPONENT** table.
7. This message is reported by your SQL platform. The name of the field the problem occurred in appears under **Column Name** in the Import Report. In this case we highly recommend that you refer also to the information regarding this import attempt in your log file.
8. Most SmartPlant Instrumentation tables contain a **Zero-ID** row which is used to maintain the linkage between the tables in the database. During the import process this row is not transferred from the source data to the target data, in which case the Import Utility displays an appropriate message in the Import report.

System Codes Table

Process Data Property	Code Description	Value in Import Source
Build-up Tendency	Free Value	
(lower fluid)	No	N
	Yes	Y
Coagulation Fluid	Free Value	
	No	N
	Yes	Y
Coagulation Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Colored Fluid	Free Value	
	No	N

Process Data Property	Code Description	Value in Import Source
	Yes	Y
Colored Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Corrosive Fluid	Free Value	
	No	N
	Yes	Y
Corrosive Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Erosive Fluid	Free Value	
	No	N
	Yes	Y
Erosive Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Failure Action	Close	Close
	Last	Last
	Open	Open
Flag for Above/	Above Reference Line	A
Below Reference	Below Reference Line	B
Line		
Flag for Built-up	Absolute Pressure	A
Back Pressure	Gage Pressure	G
Flag for	Center	C
Center/Tangent Line	Tangent	T
Flag for Constant	Absolute Pressure	A
Back Pressure	Gage Pressure	G
Flag for Critical	Absolute Pressure	A
Pressure	Gage Pressure	G
Flag for Design	Absolute Pressure	A
Pressure	Gage Pressure	G

Process Data Property	Code Description	Value in Import Source
Flag for Elasticity	Gage Pressure	G
Module		
Flag for Fire/Non-	Fire case	F
fire Case	Non-fire case	N
Flag for Flow	Mass flow	
	@ Operating conditions	A
	@ Base conditions	B
	@ Normal conditions	N
	@ Standard conditions	S
Flag for Flow Range	Mass flow	
	@ Operating conditions	A
	@ Base conditions	B
	@ Normal conditions	N
	@ Standard conditions	S
Flag for Flow Trip/	Mass flow	
Alarm	@ Operating conditions	A
	@ Base conditions	B
	@ Normal conditions	N
	@ Standard conditions	S
Flag for Lever	Free Value	
	No	N
	Yes	Y
Flag for Maximum	Mass flow	
Discharge	@ Operating conditions	O
	@ Base conditions	B
	@ Normal conditions	N
	@ Standard conditions	S
Flag for Maximum	Absolute Pressure	A
Pressure (Relief Valve)	Gage Pressure	G
Flag for Maximum	Free Value	
Pressure (Relief Valve)	Absolute Pressure	A
	Gage Pressure	G

Process Data Property	Code Description	Value in Import Source
Flag for Pressure	Free Value	
Range	Absolute Pressure	A
	Gage Pressure	G
Flag for Pressure Trip/	Free Value	
Alarm	Absolute Pressure	A
	Gage Pressure	G
Flag for Set Pressure	Absolute Pressure	A
	Gage Pressure	G
Flag for Variable Back	Absolute Pressure	A
Pressure	Gage Pressure	G
Flag to enter Density	Density to be imported	D
or SG	Gravity to be imported	G
Flag to enter Density	Density to be imported	D
or SG (lower fluid)	Gravity to be imported	G
Fluid Phase	Homogeneous 2-phase	H
	Non-Homogeneous 2-phase	N
	Single phase	S
Fluid State	Gas/Vapor	G
	Liquid	L
	Steam	S
	Water	W
	N/A or other	O
Solid/Powder	P	
Foaming up	Free Value	
	No	N
	Yes	Y
Foaming up	Free Value	
(lower fluid)	No	N
	Yes	Y
Handwheel	Free Value	
	No	N
	Yes	Y

Process Data Property	Code Description	Value in Import Source
Oxidizing Fluid	Free Value	
	No	N
	Yes	Y
Pipe Material	Plain Carbon Steel (SAE 1020)	1
	Inconel X, Annealed	10
	Hanel Stellite 25 (L605)	11
	Copper (ASTM B152, B124, B133)	12
	Yellow Brass (ASTM B36, B134, B135)	13
	Alum. Bronz (ASTM B169 A)	14
	Beryllium Copper 25 (ASTM B194)	15
	Cuperonickel 30%	16
	K-Monel	17
	Nickel	18
	Pyrex Glass	19
	301 S.S.	2
	Titanium	20
	Tantalum	21
	304 S.S.	3
	310 S.S.	4
	316 S.S.	5
	330 S.S.	6
	347 S.S.	7
	Hastelloy B	8
	Hastelloy C	9
	Material Not Listed	99
Seat Leakage	ANSI I	ANSI I
	ANSI II	ANSI II
	ANSI III	ANSI III
	ANSI IV (standard)	ANSI IV (standard)

Process Data Property	Code Description	Value in Import Source
	ANSI V	ANSI V
	ANSI VI (TSO)	ANSI VI (TSO)
	BS6755A	BS6755A
	BS6755B	BS6755B
	BS6755C	BS6755C
	No Tight Shut-Off	No Tight Shut-Off
	Tight Shut-Off	Tight Shut-Off
Solidifying Fluid	Free Value	
	No	N
	Yes	Y
Solidifying Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Toxic Fluid	Free Value	
	No	N
	Yes	Y
Toxic Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Transparent Fluid	Free Value	
	No	N
	Yes	Y
Transparent Liquid	Free Value	
(lower fluid)	No	N
	Yes	Y
Wiring Property	Code Description	Value
Panel Category Code	Junction Box	1
	Marshaling Rack	2
	Cabinet	3
	Field Device	4
	DCS	5
	PLC	6

Process Data Property	Code Description	Value in Import Source
Calculation Property	Code Description	Value
Calc Type	ISA Standard	1
	IEC Standard	2
Calculated Parameters	Orifice Diameter calculation	B
(D,W,DP)	Differential Pressure calculation	D
	Flow Rate Calculation	W
Flag for Full Scale	Mass flow	
Flow	@ Operating conditions	O
	@ Base conditions	B
	@ Normal conditions	N
	@ Standard conditions	S
Flag for Rupture Disk	Without Rupture Disk	0
	With Rupture Disk	1
Flag to enter	Compressibility to be imported	C
Compressibility or	Density to be imported	D
Density (for Gas)		
Flag to enter Molecular	Specific Gravity to be imported	G
Mass or SG (for Gas)	Molecular Mass to be imported	M
Meter Sub Type	Flange Tappings (Quarter of Circle Orifice)	11
	Corner Tappings (Quarter of Circle Orifice)	12
	Classical Venturi (as cast convergent section)	17
	Classical Venturi (machined convergent section)	18
	Classical Venturi (rough-welded sheet-iron conv)	19
	Flange Tappings (Square Edge Orifice)	2
	Universal Venturi	20

Process Data Property	Code Description	Value in Import Source
	ISO Long Radius Nozzle	23
	ASME Long Radius Nozzle	24
	ISA 1932 Nozzle	25
	Venturi Nozzle	26
	Diametrically Opposite Flange Tappings (Eccentric Orifice)	28
	Side Flange Tappings (Eccentric Orifice)	29
	Corner Tappings (Square Edge Orifice)	3
	Diametrically Opposite Vena Contract Tappings (Eccentric Orifice)	30
	Side Vena Contract Tappings (Eccentric Orifice)	33
	Vena Contract Tappings (Segmental Orifice)	34
	Radius Tappings (Square Edge Orifice)	4
	SBHO Meter Run with Corner Tappings	5
	SBHO Meter Run with Flange Tappings	6
	Pipe Tappings	7
	AGA Report 3 (Flange Tappings)	8
	AGA Report 3 (Pipe Tappings)	9
Meter Type	Square Edge Orifice	1
	Quarter of Circle Orifice	2
	Conical Entrance Orifice	3
	Lo-Loss Tube	4
	Venturi Tube	5
	Nozzle	6
	Eccentric Orifice	7

Process Data Property	Code Description	Value in Import Source
	Segmental Orifice	8
Orifice Material	Plain Carbon Steel (SAE 1020)	1
	Inconel X, Annealed	10
	Hanel Stellite 25 (L605)	11
	Copper (ASTM B152, B124, B133)	12
	Yellow Brass (ASTM B36, B134, B135)	13
	Alum. Bronz (ASTM B169 A)	14
	Beryllium Copper 25 (ASTM B194)	15
	Cuperonickel 30%	16
	K-Monel	17
	Nickel	18
	Pyrex Glass	19
	301 S.S.	2
	Titanium	20
	Tantalum	21
	304 S.S.	3
	310 S.S.	4
	316 S.S.	5
	330 S.S.	6
	347 S.S.	7
	Hastelloy B	8
	Hastelloy C	9
	Material Not Listed	99
Relief Valve Style	Bellows Valve	B
	Conventional Valve	C
	Pilot-operated Valve	P
Sizing Basis	Blocked Flow	B
Valve Type	Signal Seat Globe	1
	Double Seat Globe	2

Process Data Property	Code Description	Value in Import Source
	Angle	3
	Ball	4
	Butterfly	5
Well Material	Austenitic Steel	0
	Ferritic Steel	1

See Also

Working with System Codes Common Tasks (on page 76)

Unit of Measure Codes Table

Unit of Measure Type	Unit of Measure Name	Value
Area	centimeter2	cm2
	Foot2	ft2
	Inch2	in2
	Kilometer2	km2
	meter2	m2
	mile2	mile2
	millimeter2	mm2
	yard2	yd2
Capacitance	F	F
	nF	nF
	pF	pF
Capacitance/Length	F/ft	F/ft
	F/km	F/km
	F/m	F/m
	F/ft	F/ft
	F/km	F/km
	F/m	F/m
	mF/ft	mF/ft
	mF/km	mF/km
	mF/m	mF/m
	nF/ft	nF/ft
	nF/km	nF/km
	nF/m	nF/m

Unit of Measure Type	Unit of Measure Name	Value
	pF/ft	pF/ft
	pF/km	pF/km
Capacitance/Length	pF/m	pF/m
Conductivity	mho/cm	mho/cm
	S/cm	S/cm
	mho/cm	mho/cm
	mmho/cm	mmho/cm
	mS/cm	mS/cm
	S/cm	S/cm
Current	A	A
	mA	mA
Density	gram/milliliter	g/ml
	kg/cubic meter	kg/m3
	kg/liter	kg/l
	lb/cubic foot	lb/ft3
	lb/cubic inch	lb/in3
	lb/cubic yard	lb/yd3
	lb/ U.K. gallon	lb/UK gal
	lb/U.S. gallon	lb/US gal
	oz/cubic inch	oz/in3
	oz/ U.K. gallon	oz/UK gal
	lb/U.S. gallon	oz/US gal
	slug/cubic foot	slug/ft3
	ton(long)/cubic yard	tonl/yd3
	ton(short)/cubic yard	tons/yd3
Diameter and Length	1/1000 inch	MILS
	centimeter	cm
	foot	ft
	inch	in
Diameter and Length	kilometer	km
	meter	m
	mile	mile

Unit of Measure Type	Unit of Measure Name	Value
	millimeter	mm
	yard	yd
Flow	CANADIAN gallon/day	CN gal/d
	CANADIAN gallon/hr	CN gal/h
	CANADIAN gallon/min.	CN gal/min
	CANADIAN gallon/sec.	CN gal/s
	Cubic centimeter/min	cm3/min
	cubic ft/day	ft3/d
	cubic ft/hr	ft3/h
	cubic ft/min.	ft3/min
	cubic ft/sec.	ft3/s
	cubic inch/day	in3/d
	cubic inch/hr	in3/h
	cubic inch/min.	in3/min
	cubic inch/sec.	in3/s
	cubic kilofoot/day	kft3/d
	cubic kilofoot/hr	kft3/h
	Cubic kilofoot/min.	kft3/min
	cubic meter/day	m3/d
	cubic meter/hr	m3/h
	cubic meter/min.	m3/min
	cubic meter/sec.	m3/s
	grain/day	grain/d
	grain/hr	grain/h
	grain/min.	grain/min
Flow	grain/sec.	grain/s
	gram/day	g/d
	gram/hr	g/h
	gram/min.	g/min
	gram/sec.	g/s
	kg/day	kg/d
	kg/hr	kg/h

Unit of Measure Type	Unit of Measure Name	Value
	kg/min.	kg/min
	kg/sec.	kg/s
	klb/day	klb/d
	klb/hr	klb/h
	lb/day	lb/d
	lb/hr	lb/h
	lb/min.	lb/min
	lb/sec.	lb/s
	Mega cubic foot/day	Mft3/d
	Mega cubic foot/minute	Mft3/min
	Mega cubic meter/day	Mm3/d
	Mega cubic meter/hr	Mm3/h
	Mega lb/day	MIb/d
	metric ton/day	t/d
	metric ton/hr	t/h
	metric ton/min.	t/min
	metric ton/sec.	t/s
	U.K. gallon/day	UK gal/d
	U.K. gallon/hr	UK gal/h
	U.K. gallon/min.	UK gal/min
	U.K. gallon/sec.	UK gal/s
Flow	U.K. ton/day	UK ton/d
	U.K. ton/hr	UK ton/h
	U.K. ton/min	UK ton/min
	U.K. ton/sec	UK ton/s
	U.S. barrel/day	US bbl/d
	U.S. barrel/hr	US bbl/h
	U.S. barrel/min	US bbl/min
	U.S. barrel/sec	US bbl/s
	U.S. gallon/day	US gal/d
	U.S. gallon/hr	US gal/h
	U.S. gallon/min	US gal/min

Unit of Measure Type	Unit of Measure Name	Value
	U.S. gallon/sec	US gal/s
	U.S. kilobarrel/day	US kbbl/d
	U.S. kilobarrel/hr	US kbbl/h
	U.S. megabarrel/day	US mbbl/d
Force	kilogram-force	kgf
	lb-force	lbf
	newton	N
Inductance	H	H
	mH	mH
Inductance/Length	H/ft	H/ft
	H/km	H/km
	H/m	H/m
	H/ft	H/ft
	H/km	H/km
	H/m	H/m
	mH/ft	mH/ft
Inductance/Length	mH/Km	mH/Km
	nH/km	nh/km
	pH/ft	pH/ft
Inductance/Resistance	H/ohm	H/ohm
	mH/ohm	mH/ohm
Latent Heat	Btu(39)/lb	Btu39/lb
	Btu(59)/lb	Btu59/lb
	Btu(60)/lb	Btu60/lb
	Btu(IT)/lb	Btu IT /lb
	Btu(M)/lb	Btu M /lb
	Btu(th)/lb	Btu th /lb
	cal(15)/g	cal15/g
	cal(20)/g	cal20/g
	cal(IT)/g	cal IT/g
	cal(M)/g	cal M /g
	cal(th)/g	cal th /g

Unit of Measure Type	Unit of Measure Name	Value
	J/kg	J/kg
	kcal(15)/kg	kcal15/kg
	kcal(20)/kg	kcal20/kg
	kcal(IT)/kg	kcal IT /kg
	kcal(M)/kg	kcal M /kg
	kcal(th)/kg	kcal th /kg
	kJ/kg	kJ/kg
Power	mW	mW
	W	W
Pressure	atmosphere(standard)	Atm (stand)
	atmosphere(tech)	at (tech)
	bar	bar
Pressure	centimeter of Hg (0C)	cmHg 0C
	centimeter of water	cmH2O (4C)
	dyne/cm2	dyn/cm2
	foot of water (39.2C)	ftH2O
	gram-force/cm2	gf/cm2
	hecto pascal	hPa
	inch of Hg(32C)	inHg
	inch of water(60C)	inH2O
	kg-force/cm2	kgf/cm2
	kg-force/m2	kgf/m2
	kg-force/mm2	kgf/mm2
	kilo pascal	kPa
	Ksi	Ksi
	lb-force/ft2	lbf/ft2
	lb-force/in2	lbf/in2
	mega pascal	MPa
	meter water(4C)	mH2O 4C
	millibar	mbar
	millimeter of Hg (0C)	mmHg 0C
	millimeter of water	mmH2O 4C

Unit of Measure Type	Unit of Measure Name	Value
	pascal (Pa)	Pa
	psi	psi
	torr (mm Hg 0C)	Torr
Resistance	Kohm	Kohm
	ohm	ohm
Resistance/Length	kOhm/ft	kOhm/ft
	kOhm/km	kOhm/km
Resistance/Length	kOhm/m	kOhm/m
	MOhm/m	MOhm/km
	Ohm/ft	Ohm/ft
	Ohm/km	Ohm/km
	Ohm/m	Ohm/m
	statOhm/km	statOhm/km
Specific Heat	Btu(39)/(lbF)	Btu39/lbF
	Btu(59)/(lbF)	Btu59/lbF
	Btu(60)/(lbF)	Btu60/lbF
	Btu(IT)/(lbF)	BtuIT / lbF
	Btu(M)/(lbF)	Btu M / lbF
	Btu(th)/(lbF)	Btuth/lbF
	cal(15)/(gK)	cal15/(gK)
	cal(20)/ (gK)	cal20/(gK)
	cal(IT)/ (gK)	calIT/(gK)
	cal(M)/ (gK)	cal M /(gK)
	cal(th)/ (gK)	calth/(gK)
	J/(kgK)	J/(kgK)
	kcal(15)/(kgK)	kcal15/kgK
	kcal(20)/ (kgK)	kcal20/kgK
	kcal(IT)/ (kgK)	kcal IT /kgK
	kcal(M)/ (kgK)	kcal M /kgK
	kcal(th)/ (kgK)	kcal th /kgK
	kJ/(kgK)	kJ/(kgK)
Temperature	Degrees Celsius C	C

Unit of Measure Type	Unit of Measure Name	Value
	Degrees Fahrenheit F	F
	Degrees Rankin R	R
Temperature	Kelvin K	K
Velocity	ft/h	ft/h
	ft/min	ft/min
	ft/s	ft/s
	in/s	in/s
	km/h	km/h
	m/s	m/s
Viscosity	centipoise	cP
	centistokes	cS
	cm ² /s	cm ² /s
	ft ² /sec.	ft ² /s
	in ² /sec.	in ² /s
	lb/(fthr)	lb/(fth)
	lb/(ftsec.)	lb/(fts)
	lb-forcesec/ft ²	lbfsec/ft ²
	lb-forcesec/in ²	lbfsec/in ²
	m ² /sec.	m ² /s
	mm ² /s	mm ² /s
	mPas	mPas
	pascal sec.	Pas
	poise	P
	slug/(ftsec.)	slug/fts
	stokes	St
Voltage	mV	mV
	V	V
Weight	gram	g
	kilogram	kg
Weight	metric ton	ton
	ounce	oz
	pound	lb

Unit of Measure Type	Unit of Measure Name	Value
Weight/Length	kg/km	kg/km
	lbs/mft	lbs/mft

See Also*Adapt Unit of Measure Codes* (on page 78)*Working with System Codes Common Tasks* (on page 76)

SECTION 3

Merger Utility

The Merger Utility provides you with the means of transferring a selected plant hierarchy item (for example, domain, plant, and so forth) from a source domain to the same type of plant hierarchy item in an existing target domain. The source and target domains can be a part of the same database or part of different databases. You can also merge source and target plant hierarchy items within the same domain.

You run the Merger Utility in any of the following scenarios:

- You need to transfer all the data from a source domain to a target domain.
- You need to transfer all the data from a source plant hierarchy item to a target plant hierarchy item at the same level.

NOTES

- Only the Domain Administrator has access to the Merger Utility.
- The source and target domains must be of the same SmartPlant Instrumentation version. If they are not the same version, you must upgrade the domain that belongs to the earlier version.
- The Merger Utility only supports domains of type Engineering company when merging plant data. For configuration data, the Merger Utility supports engineering company and owner operator domains.

The Merger Utility changes the contents of your target database. Therefore, we recommend that you backup your target database before proceeding with the merge process.

Database Platform Support

The Merger Utility provides you with inherent support of the following database platforms:

- Oracle
- Microsoft SQL Server
- Sybase Adaptive Server Anywhere

You can use any of the above database platforms after you configured that database platform to work with SmartPlant Instrumentation.

You can also import data from database platforms other than those specified above. To do this, you need to install the appropriate drivers manually and configure the appropriate configuration files.

NOTE SmartPlant Instrumentation uses a database engine developed by Sybase for SmartPlant Instrumentation repository. This engine is called Sybase Adaptive Server Anywhere.

Configuring Your Environment

When you install the software, the Merger Utility settings are automatically configured in the appropriate configuration files. See your database manual to learn more about your database configuration.

In a Windows XP environment, the database configuration settings are located in the following registry folders:

- HKEY_CURRENT_USER\Software\ODBC\ODBC.INI
- HKEY_LOCAL_MACHINE\SOFTWARE\ODBC\ODBCINST.INI

CAUTION Do not change the setting in the configuration files if you are not familiar with the database configuration.

Start the Merger Utility

To start the Merger Utility you must comply with the following requirements:

- You must have a previously defined source and target domains with at least one plant hierarchy item at the lowest level of the hierarchy (by default, this is a unit).
- Both the source and target domains must be of the same SmartPlant Instrumentation version and sub-version.

See *Installation Guide, SmartPlant Instrumentation Setup Maintenance and Database Selection, Installing SmartPlant Instrumentation Components* to learn more about SmartPlant Instrumentation programs and utilities.

1. Select **Merger Utility** from the Intergraph SmartPlant Instrumentation program group in the Windows Start menu.
2. On the **Logon Information** dialog box, type the Domain Administrator name and password.
3. On the **Open** dialog box, expand the hierarchy as needed by clicking and select the desired <unit>.

TIPS

- Whenever you start the Merger Utility, the software prompts you to select a target <unit>. If you have already started a merge process in a previous Merger Utility session, you are prompted to resume that merge process.
- You need to select a single target <unit> before starting the merge process, the same way you do when you enter every SmartPlant Instrumentation module. You can select additional target plant hierarchy items as you proceed through the merge process. (For details of how to select additional target data, see Merging Data: An Overview .)

SECTION 4

Working with Log Files

Log files allow you to keep track of all operations during a merge process.

When you start the Merger Utility for the first time, you create a new log file. The log file keeps growing as you continue merging data unless you decide to change the current log file. The information in the log file describes chronologically the events which have taken place during the merge process. This information includes:

- Date and time in which the merge process started.
- Details of the selected source and target:
 - The database platform (for example, Oracle)
 - The domain name
 - The plant hierarchy item name on the level at which data has been transferred
- The starting ID of each table (for details of how to set the starting ID, see Setting the Merger Comparison Criteria).
- The total number of updated target rows (where the software overwrites data).
- The total number of inserted rows (new rows that were appended in the target domain).
- The total number of rejected source rows: source rows which were not transferred).
- The transferring results: whether the merge process was successful if the user stopped it or if it stopped due to merge failure.

If you start the merge process with no log file defined, the software prompts you to define a log file when you are about to start the data transfer.

NOTE SmartPlant Instrumentation uses Notepad to view the log file; however, Notepad is limited by file size that it can handle. If your log file becomes too large for Notepad, an appropriate message appears. In this case, you can view your log file using Windows Write or another appropriate utility.

Setting the Merger Comparison Criteria

You can control the way the Merger Utility identifies the source data as identical to the target data during the merge process. This is important, because when the Merger Utility encounters identical source and target rows, it can overwrite the target row or leave it intact, depending on the comparison criteria settings. You can therefore control the merge results by selecting the appropriate comparison criteria.

In SmartPlant Instrumentation, the database is organized in tables, for example: CABLE, COMPONENT, CONTROL_VALVE, and so forth. These tables contain data arranged in columns that represent various item types such as tags, cables, panels, and so forth.

For example:

The COMPONENT table contains all the tags together with the appropriate links to other tables, which utilize tags, such as: COMPONENT_MFR (Manufacturers table), CABLES (Cables table), and so forth.

You can use one or more columns in each table as the primary keys of this table. The value of the primary key of each table is unique in this table. For example, the primary key of the COMPONENTS Table is CMPNT_ID. This means that each row in the COMPONENT Table has a different value in the CMPNT_ID field.

NOTE Primary key columns are not accessible to you when you work in SmartPlant Instrumentation. The primary keys are designed only for SmartPlant Instrumentation internal use.

When comparing rows, the Merger Utility treats the source and target rows as identical only if both the source primary key and target primary key contain the same value. For example, if the COMPONENT table in both source and target rows contains the same values in the columns defined as primary keys, then the software considers both rows as being identical. In this case, the Merger Utility can either replace the entire target row with the source row or leave this target row intact, depending on the merge process settings.

You can select the appropriate primary key of every table in the database. This way you can create a different comparison criterion for each table.

CAUTION Changing the settings in the Target Definition dialog box alters the relations between the tables. We therefore recommend that you do not change these settings unless you find it necessary and only if you are familiar with the SmartPlant Instrumentation database structure. In most cases when you merge data, you do not have to modify the Merger Utility comparison criteria. If you decide to modify the comparison criteria, make sure you enter the appropriate data, as this feature changes the contents of the target. f the contractor, or extra information as required. You can type up to 40 characters in this field.

Create a New Log File

This procedure shows you how to create a new log file. It is advisable to create a new log file each time you run a merging process. You should also create a new log file if your existing log file has become too long.

1. Click **Log > New**.
2. On the **New Log File** dialog box, type the name of your new log file, select the desired path, and click **Save**.

TIP The Merger Utility opens a new empty log file automatically, even though you do not see it.

Open an Existing Log File

This procedure shows you how to open an existing log file. It is advisable to open a log file before you perform an import procedure so that you have a record of the merging process.

1. Click **Log > Open**.
2. On the **Open Log File** dialog box, select the name of the log file you want to open and click **Open**.

TIP After you create a new log file or open an existing one, it stays open even though you do not see it displayed. The log file remains active until you close the Merger Utility. (For details of how to close the current log file manually, see Create a New Log File.) When you exit the Merger Utility, the log file closes automatically and reopens when you restart the Merger Utility.

View a Log File

This procedure shows you to view the current log file and to review the previous merging process information.

- Do one of the following:
 - Click .
 - Click **Log > View**.

TIP The current log file opens for viewing in Notepad. SmartPlant Instrumentation uses Notepad to view the log file. However, Notepad is limited by file size that it can handle. If your log file becomes too large for Notepad, you will get an appropriate message. In this case you can view your log file using Windows Write or another appropriate utility.

Close the Current Log File

This procedure shows you how to close the current log file, if you to choose to merge data without a log file.

- Click **Log > Close**.

TIP The Merger Utility immediately closes the current log file. After you close the current log file you need to define a new log file to resume tracking the import process.

Delete an Existing Log File

This procedure shows you how to delete a log file when the information is no longer required.

CAUTION This action permanently deletes the selected log file from your hard disk.

1. Click **Log > Delete**.
2. On the **Open Log File Name** dialog box, select the name of the log file you want to delete and click **Open**.

TIP On clicking **Open**, the software deletes the specified log file from your hard disk.

SECTION 5

Merging Data

Before you can merge data, you must create a merge session, within which you select the source data, match the source and target data, and set the merging options.

After selecting the source data, you match the source and the target <units>. You need to do this because the source and target domains may differ in the domain hierarchy. For example, there may be more <units> in the selected source area than in the target area.

The next stage is to select the data to be merged. There are two ways you can select the data to be merged:

- Transfer all the data of selected modules or sub-modules using the module list feature. When you select this option, the software transfers the entire data for the selected item types.
- Transfer only the data that you select using the comparison list feature. With this option, you can generate comparison reports which help you to identify exactly which data needs to be merged. We recommend that you save the comparison reports as .psr files. The advantage of having the comparison reports in the .psr format is that you can re-use them in other Merger Utility sessions if needed. There are, however, some limitations:
 - .psr files reflect the situation at the time they were created. If the data has changed during the time between the report creation and its restoration, you cannot be certain that the data contained in the report is up- to-date.
 - Restore only supporting tables and reports for main item types (loops, tags, cables, panels, and so forth). Do not select composite tables such as tag and block relations.
- **NOTE** If you want to delete data that is present in the target but not in the source, you can do so only through the comparison list option.

You can manipulate, view, and print a .psr file from both InfoMaker and SmartPlant Instrumentation. SmartPlant Instrumentation provides the best interface to deal with the .psr files, as there are built-in features to filter, sort and column selection. If you edit a .psr file outside SmartPlant Instrumentation, the hidden columns become visible. This is a technical limitation that you should be aware of.

If you intend to merge data based on saved .psr files, do not save any changes made through InfoMaker (you can make changes temporarily in order to adjust the layout of the printed document, but do not save it).

Generate and save the comparison reports as .psr files. If there is a lot of data in the source and target databases, consider doing this on a per <unit> basis for the basic engineering. In this case, save the comparison reports in different folders.

If you use InfoMaker, set it so it does not retrieve the data from the database when the document is opened. To do this, do the following:

1. Open the .psr file in InfoMaker in design mode.
2. Click **Design > Options**.
3. Clear the **Retrieve on Preview** option.
4. Make sure that the **Retain Data to Design** option is selected.

In order not to run out of resources during the different comparisons, run this process in different sessions as recommended.

To improve performance, make sure that the **Build table list for merging data** check box in the **Compare Source-Target Data** window is cleared (there is no need to build a table list for merging if you do not intend to use it at that time).

The next stage is to set the Merger Utility settings which include the general options, setting the date from which to start merging the data, and selecting the tag custom field data to be merged. When you start to merge data, you can monitor the transfer process in the Merger Progress window.

The merge process includes the following major steps:

1. Selecting the source data; that is, the plant hierarchy item.
2. Matching the source data with the target data.
3. Selecting the source data to be transferred to the target domain.
4. Setting the general Merger Utility options.
5. Setting other Merger Utility options: date, user-defined fields, and log file.
6. Transferring the selected source data to the target data.

Merger Session

The following tasks are used when you create a merge session, for merging your data.

Select the Target Plant Hierarchy Item

When merging data, the Merger Utility treats the database identified in the current Intools.ini file as the target database and refers to your current plant hierarchy item as the target. This means that the source data will be merged data in that <unit>. SmartPlant Instrumentation connects to the target database when you start the Merger Utility. After the Merger Utility starts, the Open dialog box appears, where you can select the desired target <unit>.

1. Click **File > Select Plant Hierarchy Item for Target**.
2. On the **Open** dialog box, expand the hierarchy as needed by clicking  and select the desired <unit> .

Create a New Merger Session

This procedure shows you how to create a new merger session.

1. Click **Actions > New Session**.
2. In the text box, type a unique name for the session.
3. Click **Actions > Open Session**.
4. Make your definitions for the session as you require.
5. When done, on the **Actions** menu, click **Save Session**.

Open a Merger Session

This procedure shows you how to open a merger session.

1. In the **Merger Session Manager** window, select the session that you want to open.
2. Do one of the following:
 - Click **Actions > Open Session**.
 - Right-click the session, and on the shortcut menu, click **Open Session**.
3. Make any changes to the session as you require.
4. When done, on the **Actions** menu, click **Save Session**.

Rename a Merger Session

This procedure shows you how to rename a merger session.

1. In the **Merger Session Manager** window, select the session that you want to rename.
2. Do one of the following:
 - Click **Actions > Rename Session**.
 - Right-click the session, and on the shortcut menu, click **Rename Session**.
3. In the text box, type a new name for the session.

Duplicate a Merger Session

This procedure shows you how to duplicate a merger session.

1. In the **Merger Session Manager** window, select the session that you want to duplicate.
2. Do one of the following:
 - Click **Actions > Duplicate Session**.
 - Right-click the session, and on the shortcut menu, click **Duplicate Session**.
3. On the **Duplicate Session** dialog box, do one of the following:
 - Click **New** and type a new session name.
 - Select an existing session to overwrite it with the new session data.

Delete a Merger Session

This procedure shows you how to delete a merger session.

1. In the **Merger Session Manager** window, select the session that you want to delete.
2. Do one of the following:
 - Click **Actions > Delete Session**.
 - Right-click the session, and on the shortcut menu, click **Delete Session**.
3. When prompted, confirm the deletion.

Selecting the Source Domain

After you have opened a session or defined a new session, the next step is to select a domain or any plant hierarchy item within the domain. At this stage, you can also select the appropriate source modules and tables.

The source domain can be:

- The same as the target domain
- Different from the target domain but belonging to the same database
- A domain from a database other than the target domain database

NOTE You can select multiple <units> to be merged with the target.

Selecting and Matching Source Domains

The following tasks are used when you select source domains during the merge process.

Select the Same Source Domain As the Target Domain

Use this procedure to select identical source and target domains if required.

1. Open a merger session. For details, see *Open a Merger Session* (on page 142).
2. Do one of the following:
 - Expand the tree and click  **Connect**.
 - Click **Actions > Connect to Source**.
3. On the **Connect to Source** dialog box, select **Use target domain as source**.

TIP Whenever you open a new merger session, the source domain is the same as the target domain by default. Therefore, the details of the current target domain (the domain that you selected when you started this merger session) appear under Information.
4. Click **Plant Hierarchy**.
5. On the **Source Plant Hierarchy** dialog box, select as the source either the entire domain or any plant hierarchy item within the domain. For details of how to continue the merge process, see *Match the Source Data with the Target Data* (on page 146).

Select a Source Domain from Another ODBC Platform

Use this procedure to select a source domain residing in another SQL Server or Sybase Adaptive Server Anywhere database. You do this by selecting ODBC profile and using it for connection to the source database.

Prerequisites

- Make sure you have the proper access rights (logon name and password) required to connect to the source domain.
- If you need to connect to a source domain residing in another Sybase Adaptive Server Anywhere database, make sure you created an ODBC profile for connection to the source database. You can use the Internal Setup Utility options to create ODBC profiles for Sybase Adaptive Server Anywhere. The ODBC profiles that you create become available for selection in the Merger Utility.
- If you need to connect to a source domain residing in another SQL Server database, make sure you created an ODBC profile for connection to the source database. You cannot use existing profiles that are available for selection in the Merger Utility. When creating a new ODBC profile for SQL Server, make sure the new profile name is unique in the Windows registry of the machine where you run the Merger Utility.

IMPORTANT The Merger Utility does not support source domains with the As-Built functionality.

1. In the **Merger Session Manager window**, open a merger session.
2. Do one of the following:
 - Expand the tree and click  **Connect**.
 - Click **Actions > Connect to Source**.
3. On the **Connect to Source** dialog box, clear **Use target domain as source**.
4. Click **Connect**.

5. On the **Connect to Database** dialog box, from the **DBMS** list, select **ODBC**. From the Profile name list, select the source database profile.

TIP With **ODBC** being your database platform, from the **Profile name** list, you can either select a Sybase Adaptive Server Anywhere or SQL Server ODBC profile.

6. In the **Logon name** and **Logon password** boxes, type the logon name and password for connection to the source database using the selected ODBC profile.
7. Click **OK** to establish the connection to the source database and reopen the **Connect to Source** dialog box.
8. On the **Connect to Source** dialog box, click **Plant Hierarchy**.
9. On the **Source Plant Hierarchy** dialog box, select as the source either the entire domain or any plant hierarchy item within the domain. For details of how to continue the merge process, see *Match the Source Data with the Target Data* (on page 146).

Select a Source Domain from Another Oracle Database

Use this procedure to select a source domain from another Oracle database and establishing a connection to this domain.

Prerequisite

- In order to establish a connection to another Oracle database, first of all, make sure you have all the correct .dll files and the right settings in the appropriate .ini files and/or registry. Also, make sure you have the proper access rights (logon name and password) required to connect to the source database.
1. In the **Merger Session Manager** window, open a merger session.
 2. Do one of the following:
 - Expand the tree and click  **Connect**.
 - Click **Actions > Connect to Source**.
 3. On the **Connect to Source** dialog box, clear **Use target domain as source**.
 4. Click **Connect**.
 5. On the **Connect to Database** dialog box, from the **DBMS** list, select the appropriate version of your source Oracle database.
 6. In the **Server name** box, type the name of the database server.
 7. From the **Logon name** list, select a logon name to connect to the selected source database.
 8. In the **Logon password** box, type the appropriate password to connect to the selected source database.
 9. Click **OK** to establish the connection and return to the **Connect to Source** dialog box.
 10. On the **Connect to Source** dialog box, click **Plant Hierarchy**.
 11. On the **Source Plant Hierarchy** dialog box, select as the source either the entire domain or any plant hierarchy item within the domain. For details of how to continue the merge process, see *Match the Source Data with the Target Data* (on page 146).

NOTE The Merger Utility does not support source databases that have the As-Built functionality.

Match the Source Projects to the Target Projects

Use this procedure to match source and target projects if you have selected to merge configuration data and the source domain is an owner operator domain. In this way, the Merger Utility transfers data from the selected source projects to the selected target projects which you are going to link.

IMPORTANT You must perform this procedure when you select the **User Group** or **Access Rights** options for merging the data.

1. On the **Connect to Source** dialog box, click **Match Projects**.
2. On the **Match Projects** dialog box, match each target project individually to the required source project by selecting in the **Target** (left) data window, the row that represents the required target project and dragging it to the required cell under **Connected to Target Project** in the **Source** data window.

TIPS

- If projects in the source and target have the same names, you can connect them automatically by clicking **Match Names**.
 - You cannot map a project onto itself.
3. Click **OK** to return to the **Connect to Source** dialog box.

Match the Source Data with the Target Data

Use this procedure to match the source and the target <units> after connecting to a database and selecting the source domain or plant hierarchy item. In this way, the Merger Utility transfers data from the selected source <units> to the selected target <units> which you are going to link. This procedure applies where you have selected a source plant hierarchy item other than a <unit>.

1. On the **Connect to Source** dialog box, click **Match Plant Items**.

TIP If the **Match Plant Items** command button is not available, first click **Plant Hierarchy** to open the **Source Plant Hierarchy** dialog box where you have to select the domain, a plant, or an area as the source. This action automatically opens the **Match Plant Hierarchy Items** dialog box.

2. On the **Match Plant Hierarchy Items** dialog box, match each target <unit> individually to the desired source <unit> by selecting in the **Target** (left) data window, the row that represents the required target <unit> and dragging it to the required cell under **Connected To in the Source** data window.

TIPS

- You can map multiple source <units> to the same target <unit>.
 - If <units> in the source and target have the same names, you can connect them automatically by clicking **Match Names**.
 - You cannot map a <unit> onto itself.
3. Click **OK** to return to the **Connect to Source** dialog box.

TIP If you need to merge the entire plant data; that is, matching all the source and target <units>, you should consider merging the data in several separate sessions. Merging the entire plant data in one session may take a long time because it increases the time required to generate the comparison reports. Also, a single merge session requires more client and server computer resources.

Match Source And Target Naming Conventions

Use this procedure to match the loop and tag naming conventions for the mapped source and target <units>. In most cases, if the source and target <units> use the same naming convention type, you do not need to match the segment names. However, under certain circumstances, for example, if the target naming convention is the Flexible standard, you may need to match individual segments between the source and target or map segments automatically when the source and target segment names are identical.

1. On the **Connect to Source** dialog box, click **Match Conventions**.
2. On the **Match Naming Conventions** dialog box, under **Target plant hierarchy**, expand the hierarchy and navigate to the desired <unit>.
TIP If a source <unit> is mapped to the selected <unit>, the plant hierarchy of the source <unit> appears beside the target <unit> name.
3. Under **Naming convention type**, do one of the following:
 - Click **Tag** to map a tag naming convention.
 - Click **Loop** to map a loop naming convention.
4. If required, click **Clear** to clear the mapping between the naming convention segments in the source and target <units>. This action clears all the data in the **Source Segment** column.
TIP You can clear the loop and tag naming convention mapping for all <units> in the domain by clicking **Clear All**.
5. Do one of the following:
 - Under **Source naming convention**, select a row representing the segment you want to match, and drag it to the **Source Segment** column under **Target naming convention** for the required target segment.
 - Under **Target naming convention**, type in the **Source Segment** column for the required target segment the required source segment name.

TIPS

- If segments in the source and target have the same names, you can connect them automatically by clicking.
- When you drag the source name, the software displays the number of the source segment in the **Source Segment** column instead of copying the full string. You can add a substring and include fixed text in the source segment name. For example: #2 (1,3) + 'DD'. This means that the name of the second segment in the source is used. The segment itself consists of the first three characters of the source segment name, and has suffix DD without the quotes.

NOTE After matching naming conventions, it is recommended that you run the comparison list to view loop and tag names before merging the data.

Defining Merger Utility Settings

The following tasks are used when you defining the Merger Utility settings.

Define Merger Utility Settings

Before merging data in a session, you need to set the Merger Utility options.

You can determine whether to do any of the following:

- Overwrite the target rows with identical source rows.
 - Stop data merging if a source row fails to be transferred to the target.
 - Use tag names for wiring items, and use the same source and target tag and loop convention names.
1. Open a Merger Utility session.
 2. Click **Actions > Options**.
 3. On the **Options** dialog box, specify your settings as desired.

TIPS

- The **Comparison Action** tab folder becomes available only after running a comparison list.
 - The **Update Mode** tab folder becomes available only after you select **Update existing data** in the **General** tab folder.
 - When merging configuration data items, you must select **Update existing data** if you want to merge data for the **Custom Field Definitions** and **Custom Table Definitions** items. These items include tables that contain a fixed number of existing rows, and for this reason, these rows can only be updated; it is not possible to insert new rows.
4. After defining all the settings, proceed with the selection of the item types to merge by performing one of the following procedures:
 - Select the item types that you want to merge.
 - Compare the source and target data.

Select the Source Modules and Module Data

You use this option if you want to transfer all the data of selected modules or sub-modules to the target domain. You can select entire modules and/or expand the appropriate modules to select the required module data. At this stage, you can also select specific loops that you want to merge.

For example, you can select the entire Instrument Index module or you can double click the Instrument Index module icon  to expand it and select the required module data (for example, Line, Equipment, and so forth). You can also expand any Instrument Index module data, such as supporting tables.

NOTE You cannot proceed with the merge process until you select the source module and/or module data. The data window in the **Select Items** dialog box does not contain module data with the caption **Tags**. This is because the source tags are automatically selected when you select the Instrument Index module. Therefore, to merge the source tags, select the source Instrument Index module without expanding it.

1. Open a **Merger Utility** session.
2. Click **File > Preferences**.
3. Click the **Item Type** tab.
4. Under **Merge data** for, do one of the following:

- Click **All plant items** to select all items in the plant for data merging. This option is available only if you have connected to an engineering company domain.
- Click **Configuration data items** to select configuration data items only for merging. Configuration data is background data that includes default panels and cables, specification forms, instrument types, and various supporting table data. This option is available for any database connection, whether it is part of an owner operator or engineering company domain. This option is useful where you need to populate several domains with basic data from the same source.

TIPS

- When merging configuration data items, on the **Merger Preferences** dialog box, you must select **Update existing data** if you want to merge data for the Browser with Specification item. This ensures that the browser views open properly after merging.
 - When merging configuration data items, you must select **Update existing data** if you want to merge data for the **Custom Field Definitions** and **Custom Table Definitions** items. These items include tables that contain a fixed number of existing rows, and for this reason, these rows can only be updated; it is not possible to insert new rows.
5. Return to the Merger Session Manager and do one of the following:
 - Expand the tree and click  **Select**.
 - Click **Actions > Select Items**.
 6. On the **Select Items** dialog box, select the module data that you want to transfer from the source domain to the target domain.

TIPS

- A check mark  appears beside everything that you select.
 - Using the **Select all** check box to select items is not the same as selecting all the items in the data window. If you select the **Select all** check box, the software selects all plant items and all configuration data items (excluding **User Group** and **Access Rights**), regardless of which items appear in the data window.
7. To make a more precise selection of the source data by selecting the required source table (applies only if you selected **All plant items**), do the following:
 - a. Click **Advanced**.
 - b. On the **Advanced Selection** dialog box, select the source table to be merged to the target domain.
 8. Click **OK** to save the Merger Utility settings.
 9. When prompted, click **Yes** to confirm your selection of the source data.

Select the Source Item Types to Merge

You can make a more precise selection of the source data. You do this by selecting the source tables to be merged (for example, Manufacturers Table, Status Table, I/O Table, and so forth) in the **Advanced Selection** dialog box.

You open the **Advanced Selection** dialog box by clicking **Advanced** in the **Select Items** dialog box.

The **Advanced Selection** dialog box consists of the following sections:

- **Filter:** Select the criteria that are used to filter the displayed tables.
- **Sort:** Select whether to sort the tables by name or by merge order.
- **(Table data):** Select the required source table to transfer to the target domain. You can also type additional data to append to the target domain during the transfer process.

NOTE If you resume a previous merge session, you see in the **Advanced Selection** dialog box the source tables which were selected in that merge session.

Now you can:

- Select the source tables that you want to merge.
 - Specify data which will be appended to the target domain during the data transfer.
 - Specify an insertion condition for the required source tables.
 - View the displayed source tables according to your required filtering and sorting options.
1. Do one of the following:
 - Under the **Select** column, select the check box for each table you require to include in the merge process.
 - Select the **Select all** check box to select all the available source tables.

TIPS

- Selected source tables are displayed in red; unselected source tables are displayed in black.
 - To locate a table by name, click Search and type the table name in the text box.
2. Select the check box in the **Insert Only** column if you want to specify an insertion condition for the selected table — any updated data in the table does not get merged in this case.
 3. To merge the reference tables of any selected source table, click **Reference Tables**.

NOTE All the reference tables associated with the selected source table are automatically selected for merging.

Select the Source Tables to Be Merged

You can select specific item types in the source that you want to merge:

- Wiring — All source wiring items, reference items, or plant (user- created) items.
 - Documents — All documents saved to the database or just P&ID document numbers, or specs, process data sheets and calculation sheets, or all documents apart from specs, process data sheets and calculation sheets.
1. With the **Advanced Selection** dialog box open, click **Data Types**.
 2. On the **Data Type Selection** dialog box, under **Wiring**, select the source wiring items you want to merge in the target domain.
 3. To select the source documents, under the **Documents** select the source documents you want to merge in the target domain.

TIP When merging P&ID document numbers, the associated source data such as specifications, tags, and loops, is not transferred.
 4. Click **OK** to close the **Data Type Selection** dialog box and return to the **Advanced Selection** dialog box after accepting the values.

Specify an Insertion Condition

You can specify an insertion condition for every selected source table. This way you instruct the Merger Utility to insert every selected source row of the selected source table, which complies with the table's insertion condition. Note that the insertion condition affects only the source tables which you have selected to be merged.

The insertion condition can contain any combination of the following:

- Source columns
- Operators or functions
- Alphanumeric values

NOTE The insertion condition affects only the source tables which you have selected to be merged.

1. On the **Advanced Selection** dialog box, select the check box under the **Insert Only** column for the selected table.

TIPS

- Use the horizontal scroll bar to display the pertinent section of the dialog box.
- Selecting the check box under the Insert Only column causes the Merger Utility to insert any source rows (of the selected source table) which comply with the condition specified in the adjacent Condition column.

2. Under the **Condition** column, type the appropriate insertion condition.

CAUTION Make sure you type the appropriate condition, as this will affect the merge process results.

The Merger Utility provides you with the following inherent operators and functions.

Operator / Function	Descriptions	Example
=	Equal to	cpmnt_mfr = 'Shell'
>	Greater than	cmpnt_name > '101'
<	Less than	item_price < 100
>=	Greater or equal to	num >= 10
=<	Less than or equal to	item_price =< 30
<>	Not equal to	prefix <> 'AA'
AND	Include the following expression in the filter combination	name AND num <> 0
OR	Accept either the previous or the following expression in the filter combination	Loop OR line = "
NOT	Select the value opposite to the following expression	NOT (item_price = 0)
LIKE	Select a value that is similar to the one in the '%[value]%' field	cmpnt_name LIKE '%AA%'

Operator / Function	Descriptions	Example
IN	Select a value that is equal to one of those specified in the parentheses	cpmnt_name = IN ('101','103'
BETWEEN	Select a value which is within the following interval	item_price BETWEEN 100 AND 500
IS NULL	Equal to NULL	Loop IS NULL
IS NOT NULL	Not equal to NULL	line IS NOT NULL

TIP The above operators and functions are those used in the WHERE string of the SQL statement.

You can also use special functions which are native to the source database.

The following table describes some of the most common functions. The source databases which provide each function are specified beneath the function name (in *italics*) in the **Function** column. The function output is described in the **Example** column.

Function	Descriptions	Example
LTRIM(<value>) dBase Sybase Adaptive Server Anywhere 10.0 Oracle 10g SQL Server	Remove all leading spaces in the field indicated in the parentheses	LTRIM(cmpnt_mfr) cmpnt_mfr = 'Shell' LTRIM(cmpnt_mfr)='Shell'
RTRIM(<value>) dBase Sybase Adaptive Server Anywhere 10.0 Oracle 10g SQL Server	Remove all trailing spaces in the field indicated in the parentheses	RTRIM(cmpnt_num) IS NULL cmpnt_num = '108-FT 100' RTRIM(cmpnt_num)='108-FT 100'
SUBSTRING(<value>,<begin>,<count>) dBase Sybase Adaptive Server Anywhere 10.0 Oracle 10g	Retrieve a part of the field indicated in the [value] data field from the [begin] position for the number of characters	SUBSTRING(cmpnt_mfr,1,4) cmpnt_mfr = 'Shell' SUBSTRING(cmpnt_mfr,1,4)='She ll'
SUBSTR(<value>,<begin>,<count>) SQL Server	indicated in the [count] field	SUBSTR (cmpnt_mfr,1,4) cmpnt_mfr = 'Shell' SUBSTR(cmpnt_mfr,1,4)='Shel'
UCASE(<value>) dBase Sybase Adaptive Server Anywhere 10.0	The upper case format of the contents of the field	UCASE(cpmnt_name) cmpnt_name = '101-aa' UCASE(cmpnt_name)='101-AA'
UPPER(<value>) Sybase Adaptive Server Anywhere 10.0 Oracle 10g SQL Server	indicated in the [value] data field	UPPER(cpmnt_name) cmpnt_name = '101-aa' UPPER(cmpnt_name)='101-AA'

Function	Descriptions	Example
LCASE(<value>) dBase Sybase Adaptive Server Anywhere 10.0	The lower case format of the contents of the field	LCASE(Loop_name) Loop_name = '101-AA' LCASE(Loop_name)='101-aa'
LOWER(<value>) Oracle 10g SQL Server	indicated in the [value] data field	LOWER(Loop_name) Loop_name = '101-AA' LOWER(Loop_name)='101-aa'

NOTE When a table is defined on a specified level, it contains data which is unique on that specified level. For example, the CABLE Table is defined per area. Therefore, the CABLE Table contains data which is unique only on the area level of the domain.

Filter And Sort the Displayed Source Table List

You can filter and sort the displayed source tables. You do this by selecting the options in the appropriate parts of this dialog box.

NOTE Filtering and sorting the source data in this dialog box does not affect the results of the merge process.

- To sort the table list which is displayed in the **Advanced Selection** dialog box, do one of the following:
 - Click **By name** to list the source tables by table name
 - Click **By merger order** to list the source tables by the order in which they will be merged during the transfer process (the merging order).

TIP You cannot change the merge order because it is automatically determined by the Merger Utility.

- To filter the data which is displayed in the **Advanced Selection** dialog box, specify the filter conditions by doing one of the following:
 - Select **All** to display tables at all levels in the domain.
 - Select **Selected** to display only tables that were selected for merging.
 - Select **Per domain** to display only tables that relate to the domain level.
 - Select **Per plant** to display only tables that relate to the plant level.
 - Select **Per area** check box to display only tables that relate to the area level.
 - Select the **Per unit** check box to display only tables that relate to the unit level.

Merging Browser Views

Selecting Browsers on the **Select Items** dialog box enables you to merge browser view style, filter, and sort settings. When merging a browser view set as the default view in the source, you must make sure that the default view name is unique within the current domain. If the view is not unique, you must rename the view in the Browser module before starting the merge process.

Selecting Source Data Using the Comparison List

This option enables you to compare the source and target data before you select it to be merged. You can select item types to be compared either in batch mode (group mode) or one by one. If you use group mode, the Merger Utility allows you to save the comparison list in a number of file formats (psr, dbf, xls, and so forth). If you do not select group mode, the Merger Utility displays the comparison data in a special dialog box for each item type that you select in the **Compare Source-Target Data** window.

After running the comparison list, you should examine the comparison results carefully and select the desired data transfer mode and transfer parameters. For example, you can determine whether you want to delete target data that does not exist in the source or whether you want to delete all the tags associated with a deleted loop, and so forth. You can also access specific comparison data, such as Specs, Process Data, Cross Wiring, Signals, and so forth, depending on the item type you selected to compare. Furthermore, you can customize the comparison list data display by filtering and/or sorting the data according to your needs.

Selecting Source Data Using the Comparison List

The following tasks are used when selecting source data using the comparison list.

Define Comparison List Options

This procedure shows you how before comparing data in a session, you set the comparison list options.

You can determine whether to do any of the following:

- Include or exclude wiring data when comparing tag data.
 - Include or exclude connections when comparing wiring data.
 - Include or exclude complementary data in the comparison.
1. With the Merger Session Manager window open, click  to display the Compare Source-Target Data window.
 2. Click Actions > Options.
 - a. On the Merger Compare Data Options dialog box, do the following to specify how the Merger Utility auto-selects and merges wiring information:
 - If you selected Tag in the Compare Source-Target Data window, click one of the following settings under Wiring selection by tag to merge wiring data:
 - No wiring — The software includes no wiring data with the selected tags during the transfer: the wiring information of the target tags remains intact.
 - Instrument wiring — The software includes all the device panel and device cable data relevant to the selected tag be included, that is, only the field device panels and cables are created for the selected tags. If you select this option, make sure that you also select Without connections under Selection by panel/cable.
 - All wiring — The software includes the entire signal data that is relevant to the selected tag.
 - a. If you selected the Cable, Set, Wire (Plant) and/or Panel, Strip, Terminal (Plant) options in the Compare Source-Target Data window, select one of the following settings to merge wiring data:

- Without connections — The software includes no connection data with the selected item type during the transfer, that is, when selecting panels and/or cables, only their structure is selected. This is useful when merging or moving cables or panels from one domain to another. You can access the connection information by clicking **1 Side** in the comparison list and select the relevant rows.
 - With connections — The software includes the relevant connection data during the transfer, that is, when selecting cables or panels, their connections are also selected. This option instructs the Merger Utility to select all the relevant panels, cables, tag numbers, loop numbers, and all the rest of the required data. You can refine the selection by canceling the selected connections.
- b. Under Complementary data, beside each item, select the **Select** check box to merge complementary data (specifications, process data, hook-ups, loop module data, calibration data, custom field data, and other items).

Define a Comparison List Style

This procedure shows you how when displaying comparison data for an item type, you can specify which properties of that item type you want to appear in the comparison list by defining a style. By means of a style you can determine which columns are available, the order of the columns, column widths, column header text, and the appearance of the column header: border, background color, and overall height.

1. With the **Merger Session Manager** window open, click  to display the **Compare Source-Target Data** window.
2. Select an item type from the **Comparison Item Tree** and do one of the following:
 - Click **Actions > Create Style**.
 - On the toolbar, click .
 - Right-click the item type, and on the shortcut menu, click **Style**.
3. Specify the comparison list layout as follows:
 - Change the column sequence by dragging the column header to the required position.
 - Change the column widths by dragging the right border between the columns to the left or right as needed.
 - Adjust the overall column header height by dragging the lower border of the header up or down.
4. To change the header text, double-click inside the header to open the **Edit Column Name** dialog box and edit the text as required.
5. Do one of the following:
 - Click **Actions > Style Properties**.
 - On the toolbar, click .
6. On the **Comparison List Style Properties** dialog box, from the **Border** list, click the border type that you require for the header.
7. Select **View** beside each column that you want to appear in the style.

TIP To display all the columns, select **View all**; to display none of the columns, clear **View all**.
8. To choose a background color for the comparison list header, click **Color** to open the **Windows Color** dialog box, where you can specify the color that you require.
9. When done, click **OK** to accept the values and close the **Comparison List Style Properties** dialog box.
10. Click **Actions > Save** to save the style for the selected item type.

11. Click **Actions > Close** to return to the **Compare Source- Target Data** window.

Compare Source and Target Data

This procedure shows how you can compare data between the source and the target by opening a comparison list for a selected item type. You can then select which data items to merge. You can also specify the items that you want to display and print a report for the displayed items.

1. With the **Merger Session Manager** window open, click  to display the **Compare Source-Target Data** window.
2. Select an item type from the Comparison Item Tree and do one of the following:
 - Click **Actions > Compare Data**.
 - On the toolbar, click .
 - Right-click the item type, and on the shortcut menu, click **Compare Data**.
 - Double-click the item type.
3. In the comparison list window for the selected item type, do one of the following:
 - To filter the data records to display, click .
 - To sort the data, click .
 - To specify which data columns to display, click .
4. To create or modify a style for viewing a comparison list that is already open, do the following:
 - a. Click  to return to the **Compare Source-Target Data** window.
 - b. Select the item type and click  to open the **Style** window.
 - c. Modify the style as desired.
 - d. In the comparison list window for the selected item type, click  to update the comparison list using the style properties.
 - e. Select the records for merging by doing one of the following:
Select the Select check box beside each data record that you want to merge.
 - To select all the data records, click .
 - To clear the selection of all the data records, click .
 - To select updated data records only, click .
 - To select inserted data records only, click .
 - To select deleted data records only, click .
 - f. Select the data to display by doing one of the following:
 - To display all the data items, click .
 - To display modified data items only, that is, where the source and target data differs, click .
 - To display selected data items only, click .
 - g. If a comparison list is available for a child item type, click the desired option on the **Reports** menu.
 - h. To generate a comparison list report, on the **Actions** menu, click **Report**.
 - i. To save the selection you made for merging, on the **Actions** menu, click **Save**.

Compare Data Using Group Mode

This procedure shows you how group mode enables you to make a batch selection of item types for comparison and subsequent transfer of data. You save the comparison data for subsequent inspection and analysis in an external file in a file format of your choice. After running the comparison list, you can open the saved external file to examine the data so that you can determine how to use the comparison list data.

CAUTION If you selected wiring item types or wiring information to be merged, do not change the settings you made in the **Merger Compare Data Options** dialog box. If you change these settings after selecting wiring item types in the comparison list, the new settings apply only to new comparison list selections. In any case, it is difficult to predict what happens when you merge data in this case, as sometimes there can be a relation between different item types that you select.

1. In the **Merger Session Manager** window, open the desired Merger Utility session.
 2. Do one of the following:
 - Click **Actions > Comparison List**.
 - Right-click the session, and on the shortcut menu, click **Comparison List**.
 3. Click **Actions > Use Group Mode**.
 4. Click **Actions > Group Mode Parameters**
 5. On the **Group Mode Parameters** dialog box, select **Save comparison list as report** only if you do not want to save the comparison results to the database. This saves the generated comparison reports as external files only. You have to make the appropriate selections under the **Save data in** section.
 6. To automate the selection process, select the type of data to be selected under **Select data**:
 - **All** — This option selects all the existing item types (for example, instrument, loop, panel, cable, and so forth) This option is recommended to get all the wiring and connection changes.
 - **Deleted** — This option selects the item types that appear in the target domain only.
 - **Inserted** — This option selects the item types that appear in the source domain only.
 - **Updated** — This option selects the item types that exist both in the source and target and need to be updated.
 - **Saved previously** — This option includes previously saved comparison data.
- TIP** It is recommended that you select the **Deleted**, **Inserted**, and **Updated** options.
7. Under **Additional options**, select the required types of comparison reports to be generated based on the selections you made under **Select data**:
 - **1 Side** — This report is for cables and panels. It reports the wire and terminal connections.
 - **Cable levels** — Generate two additional reports for cables: cable sets and wires of the cable (not mandatory if 1 Side is selected.)
 - **Panel level** — Generate two additional reports for panels: panel, strips, and sets and wires of the cable (not mandatory if 1 Side is selected.)
 - **Jumper** — This report identifies the jumpers by listing the two terminals that the jumpers are connected to.
 - **Cross Wire** — This report identifies the crossed wires by listing the two terminals/strips and panel names that the crossed wires are connected to.
 - **2 Sides** — This report lists the connections on both sides of a terminal strip. Note that this report and the relevant comparison list data cannot be used to select connections: it is for your information only.

- **Signal** — This report lists the connections for the selected tag numbers. Note that this report and the relevant comparison list data cannot be used to select connections – it is for your information only.
 - **Specs** — This report lists the differences in specifications. This is a generic report that displays the changed data only. You cannot select single attributes for an update.
 - **Process Data** — This report lists the differences in process data. This is a generic report that displays the changed data only. You cannot select single attributes for an update.
 - **For all data** — Generate comprehensive comparison reports for selected item types under **Additional options** (recommended).
 - **For selected data** — Generate comparison reports based on your selections under **Select data** for the item types selected under **Additional options**.
8. Click  to specify the path and format of the file in which you will save the comparison data. Several file formats are available, for example, .psr, .dbf, .xls. After you make your selection, the **Group Mode Parameters** dialog box displays the information in the Save data in section.

CAUTION Make sure that you select the .psr format so that you can use the report in the merge process.
 9. Click **OK** to accept your selections and to return to the **Compare Source-Target Data** window.
 10. Make your selections in the data window by clicking the desired item type. The icon beside the selected item type changes to . The software automatically selects all the child item types belonging to a selected item type. You can select or clear individual child item types if required as follows:
 - a. Double-click an item type to expand it. (Certain child item types may contain other child item types.)
 - b. Click the desired item type to select or clear it. The icon beside selected item types changes to . If a check mark  appears beside an item type, it means that the item type has already been used in a previous run of the comparison list.

CAUTION To ensure correct merging of specification data, make sure that you select all the tag numbers associated with multi-tag specifications, especially the master tag number. If you do not do so, the specification information will not be updated.
 11. Click **Actions > Build Item List** if you want make additional source selections in the module list after running the comparison list. Note that selecting this option will slow down the merge process. Do not select this option if you do not intend to use the module list feature.
 12. Do one of the following:
 - On the menu bar, click **Actions > Compare Data**.
 - On the toolbar, click .

NOTE The comparison procedure may take some time depending on the size of the database tables. At the end of the comparison procedure, you can view the comparison reports by opening the appropriate .psr files.

Check for Duplicate Items

This procedure shows you how to check for duplicated items. Sometimes, when you create data, you can add spaces or other characters accidentally, so that what is intended to be the same record with updated data is in fact viewed by the database as a separate record. You can specify redundant characters that you want the software to ignore, and then you can run a check for duplicate items based on the item names without the redundant characters.

1. With a **Merger Comparison List** dialog box open, on the **Actions** menu, click **Duplicates** to open the **Duplicate Items** dialog box.
2. Click **Characters** to open the **Redundant Characters** dialog box. Do one of the following:
 - Click **Add** to add a new row and type in the required character or string.
 - Select an existing character and modify it as needed.
 - Select a row and click **Delete** to remove that row from the list of redundant characters.
 - Click **Use Default** to clear all user changes and restore the default set of redundant characters.

TIP You can type strings of up to 20 characters.

3. Click **OK** to return to the **Duplicate Items** dialog box.

TIP The Identity Name column displays the modified item name without the redundant characters, and selects any duplicate rows using background shading: the software selects the first instance using light blue shading and duplicate items using gray shading.
4. Under **View**, click one of the following options:
 - **All items** — All the items derived from the comparison list appear.
 - **Selected items** — Only the items you select for merging appear.
 - **Duplicate items** — Only the items highlighted as duplicates appear.
5. Do one of the following:
 - In the **Select** column, select the items you want to include for data merging.
 - Select the **Select all** check box to include all of the items or clear the check box to include none of the items.

TIP Selecting or clearing **Select all** affects the displayed items only.

Restore a Saved PSR File

This procedure shows you how restoring .psr files enables you to avoid regeneration of the comparison list. Restore your existing .psr files if you are certain that they reflect updated data. If you are not sure that the .psr files contain updated data, regenerate the comparison lists either one at a time (not recommended) or in group mode.

1. In the **Merger Session Manager** window, open a session.
2. Define a new log file.
3. Define the required Merger Utility settings, depending on the item types you are about to merge.
4. Do one of the following:
 - Click **Actions > Comparison List**.
 - Right-click the session, and on the shortcut menu, click **Comparison List**.
5. In the **Compare Source-Target Data** window, highlight the item types that you want to include in the comparison.
6. Click **Actions > Restore Comparison Data**.

7. On the **Select PSR File** dialog box, navigate to the .psr file that you want to restore.
8. Click **Actions > Merge** to start generating the comparison lists.

Run the Comparison List by Making an Individual Item Type Selection

This procedure shows how you can select individual item types for comparison. You can expand an item type and run the comparison list for the selected item type only. If a child item type contains other child item types, they will also be included in the comparison list for that item type. Expand the desired child item type and make your selections.

Prerequisite

- With the Compare Source-Target Data window open, make sure that on the Actions menu, the Use Group Mode menu command is not selected (there should be no check mark beside the command).
1. In the **Compare Source-Target Data** window, expand the items in the tree so that you can highlight the individual item type for which you want to run a comparison list.
 2. To start running the comparison list and, at the end of this process, open the **Merger Comparison List** dialog box, do one of the following:
 - Click **Actions > Compare Data**.
 - On the toolbar, click .
 - Right-click the item type, and on the shortcut menu, click **Compare Data**.
 - Double-click the selected item type.
 3. If available, select an option on the **Reports** menu to display the **Connection**, **Process Data**, and **Specifications** comparison data to facilitate the selection of rows to be merged.

TIP Some of these options are disabled if they are not relevant for the item type you selected in the **Compare Source-Target Data** window.
 4. To customize the displayed data in the comparison list, on the **Actions** menu, point to **Display Records** and click one of the following options:
 - **All Records** — Displays all the available records.
 - **Selected** — Displays only those records selected for merging.
 - **Modified** — Displays modified records only, where the source and target data differs.
 5. Do one of the following:
 - Under the **Select** column, click the check box for each row you want to select to be merged.
 - Make a batch selection by right-clicking in the window, pointing to **Select Records** and clicking one of the commands: **All**, **Updated**, **Inserted**, or **Deleted** to specify the rows to include in the merge process.
 6. Click **Actions > Save**.

Filter the Comparison List Data

This option enables you to filter the rows displayed in the comparison list. You can specify a filtering condition that will filter the comparison list data.

1. With the comparison list open, on the **Actions** menu, click **Filter** to open the **Merger Comparison List Filter** dialog box.
2. To include a field in the filter condition, double-click the required field in the **Field** list and it will appear in the editable data window at the top of the dialog box.
3. Enter the required filter condition by either typing it in directly in the data window or by selecting the appropriate operators and functions.
4. Click **OK** to accept the filter condition and return to the comparison list.

NOTE Filtering the comparison list rows will not affect the selection and row sorting you made prior to filtering the comparison list data.

Display Specific Data Columns in the Comparison List

This procedure shows you how to select the data columns that you want to be displayed in the comparison list.

1. With the comparison list open, on the **Actions** menu, click **View** to open the **Select Columns for Viewing** dialog box.
2. Under **Column** list, drag the required columns to be displayed to **Columns to view**. Only the columns that appear under **Columns to view** will be displayed in the comparison list.
TIP If the comparison list currently does not display all the available rows, you can select the check boxes **Select All** to display all the columns in the comparison list, or **Include modified columns** to display only those columns that contain changed data.
3. Click **OK** to accept your selections and return to the comparison list.

Sort the Comparison List Data

This procedure shows you how to sort the comparison list data. You can select any number of columns to use for sorting the data.

1. With the comparison list open, on the **Actions** menu, click **Sort** to open the **Select Columns for Sorting** dialog box.
2. Under **Column** list, drag the required columns to be used for sorting to **Sorted columns**. The data will be sorted according to the columns that appear under **Sorted columns** in the order that they appear.
3. To remove a column to be used for sorting, drag it from **Sorted columns** to **Column** list.
TIP To change the sort order, drag all the columns to **Column** list, and then drag them in the required order under **Sorted columns**.
4. Click **OK** to accept your selections and return to the comparison list.

Display the Comparison List for a Child Item Type

This procedure shows you how to display additional detailed comparison data pertaining to a child item type (if available). The following table indicates the item types that contain child item types.

Main Item Type	Available Child Item Types for Comparison
Line	Process Data
Tag	Signal, Process Data, Specs
Panel	1 Side, 2 Side, Cross Wire, Jumper
Strip	1 Side, 2 Sides
Terminal	1 Side, 2 Sides
Cable	1 Side
Cable Set	1 Side
Wire	1 Side

NOTE The information in the comparison list for child item types is not editable.

1. With the comparison list for the selected item type open, on the **Reports** menu, click the appropriate command to open the **Merger Comparison List** dialog box for the desired child item type.
2. Under **View**, click **All** or **Changed data only** as required to filter the data to be displayed.
3. Click **Print** to print out the data.
4. Click **Close** to return to the comparison list.

TIP When the **2 Sides** option is selected for panels, strips, or terminals, if some of the connection data was changed, the merge mode will be **U** (update), and both the previous and current values will appear in the same field. Fields that contain no data signify that the selected panel has no wiring on that side.

Start the Transfer Process

This procedure shows you how to carry out the actual data transfer, after you have selected the source and target data and matched one to the other.

CAUTION It is not possible to change the Merger Utility process parameters after you start the data transfer.

1. With the **Merger** dialog box open, click **Merge** to start the transfer process.
2. At the prompt, click **Yes** to start the data transfer.

TIP If you encounter memory problems or you want to make the data transfer process faster, for details of how to speed up the transfer process or free memory resources during the transfer process, see *Perform a Preliminary Configuration* (on page 163).

3. On the **Merger Progress** dialog box, click **Stop** if required at any point during the transfer process to stop the current data transfer process.

TIP If you stop the transfer process, the Merger Utility skips all the rows of the currently processed table. You can resume the transfer process in the current merge session by clicking **Continue** or in another merge session after exiting the current merge session. When you resume the transfer process, the Merger Utility restarts the merge of the last table from which you left off.

4. On completion or stopping of the transfer process, click **OK** to close the notification message.
5. In the **Merger Progress** window click **Cancel** to return to the **Merger** dialog box.
6. View the log file to examine information about the merge results of the current merge process. For details of how to view the log file contents, see *Working with Log Files* (on page 137).

Perform a Preliminary Configuration

This feature provides you with the means to control the data flow during the merge process. You can also use this feature to select the application to view the log file. In most cases, you do not need to use this feature. However, you can use it if you encounter the following problems:

- The merge process is slow.
- Your computer has insufficient memory resources to perform the merge process.
- The current application which is used to view the log file cannot handle the current log file (for example, due to the size of the log file).
- This procedure enables you to:
 - Speed up the transfer process.
 - Free memory resources for the transfer process.

CAUTION We recommend that you do not configure the Merger Utility unless it is absolutely necessary.

1. Click **File > Preferences**.
2. Click the **Data Flow** tab.
3. Do one of the following to determine how fast the software merges data:
 - Leave the contents of the fields unchanged (the default values are: 1000 rows in the **Source** rows to retrieve data field, and 500 rows in the **Target** rows to commit data field).
 - Type a larger number of rows than the current default values. This way you speed up the merge process.
 - Type a smaller number of rows than the current default values. This way you free memory resources but it may slow down the merge process.

TIP Make sure you do not exceed your memory capacity as this may cause the merge process to fail during the data transfer.

4. To see the effect of the new settings, continue with the merge process.

Running the Comparison List in Multi-Sessions

So as not to run out of computer resources, it is highly recommended that you run the comparison list in group mode in more than one session. Make sure that on the **Actions** menu, the **Build Item List** menu command is not selected (no check mark beside the command) — this speeds up the process. There is may be no need to create a table list for merging if you do not intend to use it at that time. The following table summarizes the recommendations for the multi-session procedure.

	Session A	Session B	Session C	Session D	Session E
Mandatory	No	Yes	Yes	Yes	No
Implementation per <unit>	No	Yes	No	No	No
Long time for generation	No	Yes	Yes	Yes	Moderate

	Session A	Session B	Session C	Session D	Session E
Items for selection	Wiring Supporting Tables Default Cables Default Panels Loop Drawings Module Hook-Ups Module	Instrument Index Supporting Tables Loop Tag Line Equipment P&ID CS Tags	Panels (Plant)	Cables (Plant)	Restore Panel (Plant) PSR and run for Strip & Terminals Comparison List, then save
Group mode options	Select data — All Cable Levels Panel Levels Save comparison list as report only Note: Cable and panel levels are not mandatory.	Select data — All Specifications Process Data Signal Select the For all Data option Save the Comparison list as report only.	Select data — All Cross Wiring 2 Sides (optional) Select the For all Data option Save the Comparison list as report only.	Select data — All 1 Side Select the For all Data option	The Panel and Cable Levels can be generated separately from the PSR files of the Panel & Cable to save the computer resources during the Group mode comparison.
		If run on <unit> basis, save in different folders	Panel Levels (see session E)	Cable Levels (see session E)	

NOTE You can reduce the amount of data to be merged by selecting fewer item types, depending on the comparison information you require.

Analyzing Comparison Reports

After the comparison reports are saved as psr files (or any other type of file), you can print them out and start analyzing the data. If a field's value was changed, a **U** mode is assigned to this record and the changed column is highlighted with a light blue background.

The following example is for instrument type comparison.

Select	Mode	Component Function	Component Function Type Component Function Type Desc	Cable Cable Num	Panel Panel Name	Landing Type Landing Type Name
☒	U	FE	MASS FLOW SENSOR			
☒	U	FT	FLOW TRANSMITTER	1 PAIR	DEFAULT FIELD DEVICE 2-WIRE	2 In a row
☒	U	FT	MASS FLOW TRANSMITTER	1 PAIR	DEFAULT FIELD DEVICE 3-WIRE	2 In a row

In the second row, the highlighted changes were made in the target table. In the source table, these fields do not contain data.

In the third row, the target table does not contain an entry while the source table does. That is why there are two rows. Sometimes the field is too short to display the entire record, which causes the text to auto-scroll. Note that this can also make the field appear as two rows. You can then stretch the column to make it longer.

To analyze the data, you need to print out the reports and mark changes you want to make on the printouts. In the case of the supporting tables, this is a simple task since these tables usually include two columns. All of the supporting tables are merged in one process since they are required for the main item types. Therefore, you do not need to worry about them so much.

Concentrate on the main item types:

- Loops and tags
- Instrument Type (although this is a supporting table)
- Cables
- Panels
- Analyze the changes in process data and specifications
- Connections (1 Side)
- Cross Wires
- Jumpers
- Control system tags:
 - Loop blocks
 - Hook-up drawings

Mark the reports (use color markers if possible), mainly for wiring changes.

Merging Supporting Tables

When merging supporting tables, note the following:

- **Instrument Index module:** When selecting tag numbers, the appropriate items from the relevant supporting tables are selected. Specific supporting tables can be also merged using the comparison list options.
- **Wiring module:** Use the comparison list feature to merge specific Wiring module supporting tables. However, if a cable or a panel was selected by you or by the Merger Utility, previous selections are ignored and the entire table is merged. To merge data successfully, you must include the entire set of reference data. This rule applies to both the Instrument Index and Wiring modules. Failure to select all the reference data may result in a chain reaction which causes large amounts of data not to be merged. The Merger Utility makes sure that this situation does not occur by selecting entire supporting tables to be merged.

Guidelines for Selecting Item Types and Defining Merger Settings

The following tables provide some specific guidelines to help you define the settings for merging various SmartPlant Instrumentation items. Remember to define these settings before merging the items. If you run merger several times to merge different tables, make sure you clear the previous selections.

Selected Option	Settings	Merged Data	Comments
Instrument Type	General: Update existing data Comparison Options: Insert/Update Include all reference tables	All references as per instrument type profile: wiring supporting tables, defaults for cable, panel and connection types, I/O types, location, hook-ups and hook-up types, specification forms	
Equipment	General: Update existing data	Equipment type and equipment custom fields	
Line	General: Update existing data Comparison Options: Insert/Update Include all reference tables	Line type process data insulation, lines, and line custom fields	
Loop	General: Update existing data Identical source and tag Comparison Options: Insert/Update Include all reference tables	Loop reference tables, loops, loop custom fields, specification forms	New loops will automatically be added if new tags are added from the source.
Tag Numbers – No Wiring	General: Update existing data Identical source and tag Comparison Options: Insert/Update Include all reference tables Wiring Selections, Selection by Tag No Wiring, Selection by Panel/Cable Without Connections	Wiring supporting tables Associated instrument types Associated index and loop tables Loop drawing information Blocks/cells and types Process data, specifications and revisions Associated custom fields Associated hook-up data	Merges all associated reference tables. No wiring will be merged or changed for selected tag numbers. Selecting With Connections will not affect/add any wiring data.
Tag Numbers – Instrument Wiring (Field Devices only)	General: Update existing data Identical source and tag Comparison Options: Insert/Update Include all reference tables Wiring Selections Selection by Tag Instrument Wiring Selection by Panel/Cable Without Connections	Wiring supporting tables Associated instrument types Associated index and loop tables Loop drawing information CAD drawing block types and blocks Process data specifications and revisions Associated custom fields Associated hook-up data	Control System tags will not be merged IMPORTANT If the With Connections option is selected, additional panels, cables, and connections will not be added (junction boxes and marshaling racks) unless these are selected from Panel/Cable lists.

Selected Option	Settings	Merged Data	Comments
		Field device cables, panels, and their connections on the instrument side	
Tag Numbers – All Wiring	General: Update existing data Identical source and tag Comparison Options: Insert/Update Include all reference tables Wiring Selections Selection by Tag Instrument Wiring Selection by Panel/Cable Without Connections	Wiring supporting tables Associated instrument types Associated index and loop tables Loop drawing information Blocks/cells and types Process data specifications and revisions Associated custom fields Associated hook-up data Field device cables, panels, and their connections on the instrument side All associated panels and cables that the signals go through	Will only connect the wires associated with the selected tag numbers. CAUTION If the With Connections option is selected, additional panels, cables, and connections will be added for all the selected panels.
Cable or Panel (Plant or Default)	General: Update existing data Comparison Options: Insert/Update Include all reference tables Wiring Selections Selection by Panel/Cable Without Connections	Panel/cable structures without connections Panel/cable supporting tables	Connections can be merged if selected from the Merger Comparison List - Wire Terminal dialog box. This will include additional information as required. If you select connections (by cables) with signals, field device cables will be selected to be merged but they will not be connected. The Selection by Tag setting has no effect in this case.
Cable (with connections) CAUTION Working in this mode makes the Merger Utility select more panels, cables, and connections	General: Update existing data Comparison Options: Insert/Update Include all reference tables Wiring Selections Selection by Panel/Cable With Connections	Complete cable structures (cable/set/wires) and supporting tables All the panels / strips / terminals that are required to connect their wires	You can cancel the selection of cable connections on the Merger Comparison List - Wire Terminal dialog box. Additional panels, cables, and all their connections will

Selected Option	Settings	Merged Data	Comments
than selected. This is due to signal relations. If you are not sure, choose the Without connections option.		Instrument Index – tag numbers and their loop and supporting table records Specifications and process data Loop and Hook-Ups module associated data (for tag numbers) Wire connections All associated custom field data	be added and processed if connections with signals are involved. The Selection by Tag setting has no effect in this case.
Panel (with connections) CAUTION Working in this mode makes Merger select more panels, cables, and connections than selected. This is due to signal relations. If you are not sure, choose the Without connections option.	General: Update existing data Comparison Options: Insert/Update Include all reference tables Wiring Selections Selection by Panel/Cable With Connections	Complete panel structures (panel/strip/terminals) and supporting tables All the cables connected to the selected panel / strip, including the cable supporting tables Instrument Index – tag numbers and their loop and supporting table records Specifications and process data Loop and Hook-Ups module associated data (for tag numbers) Wire connections, including jumpers and cross wires connected to the selected panels / strips All associated custom field data	You can cancel the selection of cable connections on the Merger Comparison List - Wire Terminal dialog box. You can cancel the selection of jumpers and cross wires in appropriate dialog boxes. Additional panels, cables, and all their connections will be added and processed if connections with signals are involved. The Selection by Tag setting has no effect in this case.
Control System Tag CAUTION If With connections is selected, the entire wiring chain of all cables is selected (not recommended)	General: Update existing data Comparison Options: Insert/Update Include all reference tables Wiring Selections Selection by Panel/Cable Without Connections Selection by Tag No Wiring OR All Wiring (not recommended)	Appropriate data will be selected to be merged depending on the setting you select in the Selection by Tag section: No Wiring and Instrument Wiring will select the data required for tag assignment. If a field device exists, it will be merged too. The All Wiring option will select the entire signal data. Instrument Index – tag	You will not need this option in most cases. However, if you do, the software will merge basic engineering, wiring, and other associated data.

Selected Option	Settings	Merged Data	Comments
		numbers and their loop and supporting table records Specifications and process data CAD drawing blocks All associated custom field data Associated hook-up data	
Blocks	N/A	CAD drawing block types, CAD drawing blocks	
Association Tag/Blocks	N/A	For information only. Not selectable to be merged.	Tag and block associations are merged when merging tag numbers
Item List	Comparison Options: Insert/Update Include all reference tables	Hook-up items Hook-up libraries	Selecting the Include all reference tables option in the Comparison Options tab folder will merge the hook-types, hook-ups, and hook-up items
Hook-Ups	No special settings	Hook-up types Hook-ups Item libraries and items	
Tag and Hook-Up Association	N/A	For information only. Not selectable to be merged.	Tag and hook-up association is merged when merging tag numbers.

IMPORTANT

- Do not change the wiring selection options before starting the actual merge process. The software processes the selected rows and carries out the merge process in accordance with the settings.
- When selecting the **With connections** option in the **Wiring Selections** tab folder, records that appear only in the target are marked as deleted and are selected automatically by the Merger Utility. These selections, in most cases, will be wrong and you will have to clear the **Select** check box in the appropriate comparison list dialog box, for example, after clicking the **1 Side** button in the **Merger Comparison List** window.
- Exercise caution when using the **Delete** option in **Merge Options** dialog box, **Comparison Actions** tab folder. This option instructs the Merger Utility to actually carry out delete operations. It is possible that the software will not delete items that are associated with other items. Double check the selected records after merging. Delete data directly in SmartPlant Instrumentation if results are not satisfactory. In most cases, you do not need to select the **Delete** option.

- When selecting item types to be merged, especially Wiring and Instrument Index data, it is important not to select different item types within the same merge session. This is due to the fact that the Merger Utility processes your selections differently when it comes to tag numbers, cables, panels, and connections based on the pre-selected settings.
- The final selection of tables and item types to be merged is determined when you click **Save** to close the **Merger Comparison List** window. You can browse the selected records of different item types. Click **Close** to close the window without saving your changes.

Merging Jumpers and Cross Wires

Jumpers and cross wires are processed differently from ordinary cables since the Merger Utility has to connect both sides of the wires when adding them. To access the cross wires or jumpers, select a panel and in the **Merger Comparison List** window, on the **Reports** menu, click **Cross Wire** or **Jumper**. The dialog box displays the wires that are connected to the selected panels. Under **Records to select**, click the appropriate check boxes for the records that need to be inserted, depending on whether you selected **With connections** or **Without connections**.

You can select or clear records as required. It is important to have all the jumpers and cross wires existing in the Wiring module for further processing.

NOTE When you select a panel using the **With connections** option, the Merger Utility automatically selects the jumpers and cross wires.

Merging Specification Forms that Include Custom Title Blocks

When you associate custom title blocks with specification forms, two methods of association are available:

- A separate special title block definition for each spec form
- A common standard title block definition used for all the forms in the domain

When merging data in update mode, you must analyze your source and target databases to determine which option they are using for specification form custom title blocks. If the options are identical in both, or if the target uses the standard option, you can merge the data without any problems.

CAUTION If the source database uses the standard title block assignment method, and the target uses the special title block assignment method, you are likely to lose data after merging. In this case, your System Administrator must change the **Custom title block assignment** method option in the source domain from **Standard** to **Special**.

Customizing the Comparison List Display

The Merger Utility enables you to customize the comparison list data display. You can filter and or sort the data according to your needs. You can select the columns you want to view, in which case the other columns will not be displayed. It is also possible to display only the data lines that you selected for the merge process (selected check boxes in the **Select** column). Another way of choosing the rows to display is to select the **By mode** option. In this case, you can display deleted, inserted, and or updated rows.

Post Merging Actions

After the merge process has been completed (in one or several sessions), it is recommended to test the results. In some cases, there might be a need to re-propagate signals to certain tag numbers in the Wiring module (some manual adjustments may be required in the database). This is required for tag numbers that were created in one database in the field, but in the other database they originated in a DCS or PLC.

For a large quantity of data, it is recommended running the comparison lists again to verify that all new items were inserted and there are no missing connections or cross wires.

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